Railway Age

Vol. 85 September 8, 1928 No. 10

On the Boston & Albany at Boston, Mass.

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Published every Saturday by the Simmons-Boardman Publishing Company, 34 North Crystal Street, East Stroudsburg, Pa., with executive offices at 30 Church Street, New York.

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WASHINGTON: 17th and H Sts., N. W.
CLEVELAND: 6007 Euclid Ave.
SAN FRANCISCO: 215 Market St.

The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.).

Subscriptions, including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free; United States, Mexico and Canada, $6.00. Foreign countries, not including daily editions $8.00.

Subscriptions for the fourth issue each month only (published in two sections, the second of which is the Motor Transport Section) payable in advance and postage free; United States, Mexico and Canada, $1.00; foreign countries, $2.00. Single copies, 25 cents each.

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Railway Age

Vol. 85, No. 10 September 8, 1928

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Traffic Men to Study Passenger Problems

THE docket of subjects to be considered at the annual meeting of the American Association of Passenger Traffic Officers at Colorado Springs, Colo., on September 25 and 26, indicates an earnest endeavor to ascertain the causes of the decline in traffic and to develop adequate methods for holding the present business as well as obtaining additional patrons. The subjects listed for consideration include all phases of the problem, such as the pooling of train service between common points, the staggering of schedules to provide adequate service at a minimum cost, airplane travel, the substitution of rail motor cars and the refinements of service to increase the attractiveness of rail travel, particularly roller bearings, electrification, ventilation and "room cars." The outstanding experiences of carriers in the development and retention of passenger traffic as well as the results obtained from the authorization of tourist and convention fares, cheap excursions and other expedients to increase passenger revenue, including the methods established to meet competitive conditions arising from new transportation facilities offered by the motor coach, the automobile and the airplane, will be considered. It has been suggested that those carriers which have operated motor driven cars on rails present comparative reports of passengers, revenues and expenses and indicate the effect of this substitution upon motor coaches operating between similar points. The results of a study of passenger conditions by the Association should prove valuable to the railroads because of the familiarity of the traffic men with the peculiarities of the traveling public.

What Is Cost?

AN automobile manufacturer, let us assume, could determine how much each car produced costs him. All he would have to do would be to take his total output for a definite period and divide it into his total expenses for that period. Suppose, however, his factory were not making just one type of product, but thousands; and suppose that all his plant and all his employees help in making each of these thousands of products. There could be no allocation of actual costs to each unit of, say, automobiles, airplanes, tractors, combined harvesters, mowing machines, ditchers, cranes, and so on. The costs could be arbitrarily assigned on some basis acceptable to the manufacturer, but the resulting figures would not be actual costs. So-called costs could be determined on the railroads in the same way, but what purpose would be served other than to gratify statistical curiosity? If there were some one unit for measuring transportation production, the total expenses of the railroads, divided by the production, would produce an actual cost. But no such yard-stick exists. Railroad costs, to serve any general purpose, must first be divided between freight and passenger, which relatively elementary division even cannot be accomplished without the use of arbitrary apportionments. Then the passenger expenses would have to be subdivided among the various classes of transportation rendered by passenger trains—such as mail, express, baggage, suburban, through, local, etc. The freight costs would have to be subdivided according to the different rates. This would mean so many millions of subdivisions of cost as to be beyond the human mind even to realize, much less use. Anyone who advocates cost accounting for the railroads should be required to produce a working model—a requirement similar to that of the Patent Office for inventions relating to perpetual motion.

Be an Exemplary Citizen!

FIFTY-THREE thousand employees of the Pennsylvania Railroad own automobiles; and the company in its employees' newspaper, The Pennsylvania News, appeals to them to set a good example when approaching railroad crossings by slackening speed, looking both ways and listening for trains. The appeal, signed by Thomas H. Carrow, superintendent of safety, assumes that railroad men, being habituated to obeying strict rules, scarcely need to be told their duty in this matter; yet he very properly asks them to set a standard not only high, but very high. Among the saddening items regularly appearing in the Monday morning news there is now and then one telling of a railroad man, perhaps a locomotive engineman, in his own car, coming to grief on a crossing. Mr. Carrow even thinks that the "back-seat driver" may have a useful function in this connection. If there are 53,000 wives in Pennsylvania territory who are in position to set the good example called for, the aggregate influence of the 106,000 is not to be despised. Are there other railroads whose employees are so well favored that one-third of them own automobiles? If so, it may be possible to "make a dent" in the minds of an appreciable percentage of the twenty million American automobile drivers. It is to be noted that Mr. Carrow does not call for an absolute stop rule. And yet, the absolute stop for trains at unsignaled crossings (of railroad with railroad), established some 75 years ago, is still retained; a fact which may well remind us that to secure 100 per cent safety under a rule calling for the exercise of discretion as to speed at every crossing is not an easy accomplishment. The positive stop rule simplifies the driver's problem, and as a promoter of uniformity is not by any means a negligible ele-

ment. The driver who regularly stops at all crossings not only thereby cultivates a due sense of caution, he publishes to the world the fact that he is thus fortifying himself.

The Growth of Air Transportation

AS recently as January 1, 1926, there were only four air transportation lines in the United States, two of these extending along the transcontinental route between New York and San Francisco, Cal., and the other two being short routes at Seattle, Wash., and New Orleans, La., designed to speed up the foreign mail service. At the present time, two and one-half years later, there are 27 air mail lines in operation and 10 additional non-mail lines, covering 11,764 miles of air mail routes and 2,825 miles of non-mail routes. Fifteen of the lines are carrying express under contract with the American Railway Express Company. Virtually all of them are carrying passengers, either in mail planes, in the case of the air mail contractors, or in planes designed especially for passenger transportation. Five additional air mail routes are scheduled to begin operation at an early date and the number of proposed air passenger routes, although indefinite, is known to be large. Included in the latter are several coordinated airway and railway operations sponsored by steam railways, one of which is already in existence.

The speed of the development of air transportation is comparable to the speed of air transportation itself. No one can foretell the proportion of the country's passenger, express and mail traffic that the airway lines will be handling a few years hence. The railways cannot afford to ignore this new form of transportation as they did, for a time, the development of transportation on the highways. It is gratifying, therefore, to note the signs of active interest in air transportation that a number of the railways are displaying.

Locomotives Intensively Used

THE following example of intensive locomotive use is taken from the records of a western road, which, in the past few years, has been making a steady gain in mechanical department and general operating efficiency. Between the latter part of January, 1923, and January 1, 1928, a group of 15 Mountain-type locomotives on this road accumulated a total of 6,753,902 miles in 1794 days, or an average of 2454 miles a day throughout the period mentioned. Each locomotive was held in shop an average of 222 days for all classes of repairs, not including, however, the time held at the end of runs for ordinary repairs. The average mileage, exclusive of the repair periods, therefore, was 286.4 miles per locomotive per day, a highly creditable performance. Doubtless the most important single contribution of the mechanical department to this record was the maintenance of the locomotives in such condition that they could be kept on the road. The general improvement in locomotive maintenance standards is indicated by the fact that locomotive failures decreased from 16.71 per 100,000 miles in 1923, to 0.38 in 1928. In this period the mileage per flue removal and general repair increased from 45,000 to 100,000, and the cost of repairs decreased from 40 cents per mile in 1923 to 26 cents in 1928.

One Way to Reduce Expenses

IN 1918 the Lehigh Valley expended 11,629,549 man-hours in the maintenance of its tracks and structures. In 1927, only 7,426,245 man-hours were required. In other words, with more exacting traffic requirements, at least equal standards of maintenance were provided with 36 per cent less labor. In a similar manner the Delaware, Lackawanna & Western, whose high standards of maintenance are likewise universally recognized, has reduced its ratio of maintenance of way expenditures to total operating revenues from an average of 11.11 in 1921 and 1922 to 9.81 in 1926 and 1927, a level approached by few roads. These figures are indicative of the trend in maintenance of way work that is evident in varying degree on nearly every road and that is pronounced on some. They point to the fact that we are entering a new cycle in maintenance operations.

It is not long since the design of the track structure was governed by the necessities of traffic, and practically the only consideration was the provision of a strength sufficient to carry the loads with reasonable safety. Likewise, in the use of labor, the primary, if not almost the sole, requirement was to get the work done. Cost, while not ignored, received secondary consideration.

In the cycle in which we are now progressing, cost is being given greatly increased prominence, and ultimate economy has become the major consideration. Take the track structure as an illustration. The treated tie costs considerably more than the untreated one. During its life it renders no better service than its predecessor. Its only justification is the more extended service that it renders, with a corresponding reduction in the annual cost per year, brought about by the decrease in the demand for material and for labor for its replacement. That this is very real is shown by the experience of the Atchison, Topeka & Santa Fe which has reduced its average annual tie requirements from 3,750,000 in 1910 to 2,000,000 now, notwithstanding an increase in mileage. In other words, its purchasing department is now called upon to buy only slightly more than half the number of ties bought 15 years ago and the time formerly required by its track forces each year to replace 1,750,000 ties is now available for other operations.

The same trend towards permanency is being shown in the selection of rail. In 1917 only 25 per cent of tonnage rolled consisted of rails weighing 100 lb. per yard or more, whereas in 1927 this proportion rose to 69 per cent. The number of trains that are now passing daily over rails of 90-lb. and other sections lighter than 100-lb. affords adequate proof of the safety of these rails. The justification for heavier rail is afforded, therefore, by its longer life and the reduced labor required for track maintenance.

So much for materials. The same trend towards ultimate economy is equally or even more evident in the adoption of equipment designed to reduce the number of men required. Rail-laying machines, ballast cleaning devices, ditchers, track shifters, spreaders, tie tampers and paint sprayers are indicative of a wide variety of equipment that has been developed largely during the past decade to reduce the number of men required for specific operations. Much of this equipment has passed beyond the experimental stage and has become standard on many roads. Other equipment is now undergoing

test and development, while still other devices are appearing almost daily for the first time. In their various stages of development, the application of all these devices is prompted by considerations of economy in the performance of specific operations.

Results such as those attained by the Lehigh Valley and the Lackawanna are the logical outcome of liberal expenditures made to secure ultimate economy—economy produced alike by the use of more permanent materials and by the use of labor-saving equipment. It is to be expected that the results are not as pronounced on most roads as on those cited, for the development has not yet been as great. In fact, on some roads, the development has as yet scarcely started and has not been sufficient to offset the demands of increasing or more exacting traffic or improvements in standards of maintenance. Nevertheless, there is nothing proprietary or exclusive about the results secured by the two roads mentioned for they are possible for any road which will make similarly careful expenditures for the same objective.

It may not be amiss for railway executive and maintenance officers to take stock of the expenditures which they have made in this direction in recent years and to determine the results that they are securing from them. The results are apt to reveal greater progress and greater economies than may be generally appreciated. Such studies will also provide an incentive to continue, possibly at an accelerated rate, expenditures in this direction to effect still greater savings, for savings such as these and tend to make a large contribution to net operating income.

Is the Wooden Trestle Obsolete?

IT is fully a quarter of a century since the first reinforced concrete slab span was built in this country to carry railroad loading. To determine where that structure was built and by whom, would require much historical research, but the credit for the development in this field must be given primarily to four middle western roads, the Burlington, the Illinois Central, the Milwaukee, and the Wabash, which built many reinforced concrete trestles, track elevation structures, and large box culverts of reinforced concrete at a time when nearly all other roads were employing concrete in the superstructures of bridges only as an encasement of I-beams or other steel members.

Time has wrought marked changes in the attitude toward the use of reinforced concrete beams or slabs as the support for railway tracks, for there are now few railways that do not have at least some reinforced concrete bridges, and a number of roads have made the concrete trestle the standard form of construction for all bridge openings on main lines where short spans are permissible or practicable. However, this increased popularity of the short-span concrete structure has by no means resulted in the obsolescence of the wooden trestle or placed any cloud on its safety as a railroad structure, for many of the fastest and best known passenger trains in the United States cross open-deck, wooden-pile trestles every day. The concrete trestle meets its greatest competition from the ballast-deck, creosoted-timber trestle, which, when properly constructed, fulfills the functions of an adequate, safe railway structure as well, save for the moot question of fire hazard.

The decision as to which type of structure to build is influenced primarily by determinations of relative economy in terms of the annual cost to perpetuate the structure. But the accuracy of such estimates is subject to limitation because they are contingent of forecasts of relative life and costs of future replacement. Therefore, while each has its staunch advocate, there is now no preponderant preference for either one or the other, and there is no reason to anticipate a general discarding of the wooden trestle—of the creosoted, ballasted type for main line use and the open type on branch lines—for many years to come.

Our Supposed Policy of Regulation and Our Real One

UNITED States Senator Smith W. Brookhart of Iowa is reported to have made the following statement in a speech in Chicago on Labor Day:

"The railroads are given a protected income of at least 5½ per cent on many millions of dollars in watered stock." Every intelligent person knows that the Transportation Act does not say anything about income on "watered stock", but provides that rates shall be so adjusted to enable the railways to earn, as nearly as may be, a fair return annually upon the value of their properties. Having been made at the time it was, however, Senator Brookhart's assertion serves to call attention to the wide difference between the policy of regulation supposed to have come into effect almost exactly eight years before he delivered his speech, and the policy that actually has been and still is being followed.

It was just eight years on September 1 since the guarantees of net return given to the railways as a result of the adoption of government operation finally were withdrawn and the rate-making provisions of the Transportation Act were assumed to have gone fully into effect. The nation had had experience from 1906 to 1918 with effective federal regulation of rates, and an experience of two years with government operation. Both kinds of experience had been very unsatisfactory. Regulation had resulted in a serious decline of railway development, government operation had resulted in large deficits, and there had been protracted and costly car shortages under both.

The Transportation Act was adopted after prolonged hearings and study by committees of Congress to avoid a repetition of this experience. Its most important part consisted of the rate-making provisions, and they were intended to assure the railways of a fair annual return as a means to assuring to the public good and adequate transportation. The Interstate Commerce Commission, as the agent of Congress, first held that 6 per cent, and later that 5¾ per cent, would be a fair return on the tentative valuation made by it. This constituted, and was generally accepted, as an assurance to the railways by both Congress and the Interstate Commerce Commission that they would be allowed to earn this return.

A comparison of Senator Brookhart's misleading remark with statistics showing what the railways actually have earned serves to emphasize how completely the government of the United States has failed, and is still

failing, to make good the assurance given by it to the railways. The Commission has not brought its tentative valuation up to date, but it is possible to do this with approximate accuracy by adding to the tentative valuation as of December 1, 1919, the investment since made. Statistics showing the net operating income earned by the railways under the Transportation Act are available from September 1, 1920, to June 30, 1928—only two months less than eight years. During this time the eastern roads failed by $446,000,000, the southern roads by $98,000,000 and the western roads by $871,000,000 to earn what the commission held would be a fair return on its tentative valuation. For the railways as a whole the deficiency was $1,415,300,000. The commission's tentative valuation is less than the investment in the property shown by the books. If it be assumed that, as the railways contend, they are entitled to earn the so-called "fair return" on their property investment at least, the deficiency in net operating income during this period was $2,780,000,000.

Whatever the actual deficiency incurred has been—whether it has been larger or smaller than either of the figures given—it is certain that the commission, the official agency of the government for the regulation of railways, has completely failed to carry out the direction of the Transportation Act that rates should be so adjusted as to enable the railways to earn a fair annual return. The commission itself repeatedly has admitted that the railways have not earned, and are not now earning, a fair return measured by any standard.

All this raises a most interesting and important question. Must railway managers and investors decide that the government of the United States can no longer be trusted—that it will give assurances to such a large business interest as the railways, and then knowingly, deliberately and persistently refuse to make them good? The business conditions which have existed in the United States since 1920 afford no justification for the policy that has been followed. Part of the time business has been poor, and part of the time it has been unusually good, and on the average it has been normal. Why, then, has the Interstate Commerce Commission, acting with the full power of the government, persistently failed to so regulate rates as to enable the railways to earn the return to which it has itself held they are entitled?

What is the government's policy of regulation? The provisions of the federal Constitution against confiscation of property, the provisions of the Transportation Act, and the rulings of the commission as to what would be a fair return for the railways, seem to make the government's policy quite clear. But the Constitution, the rate-making provisions of the Transportation Act and the commission's own general rulings are being ignored in the regulation actually applied. Why does the government year after year hold out one policy to railway managers and investors and follow an entirely different policy? If the policy enunciated in the Constitution and the Transportation Act is sound, why not carry it out? If the policy being actually followed is fair and sound, why not make the Constitution and the laws conform to it?

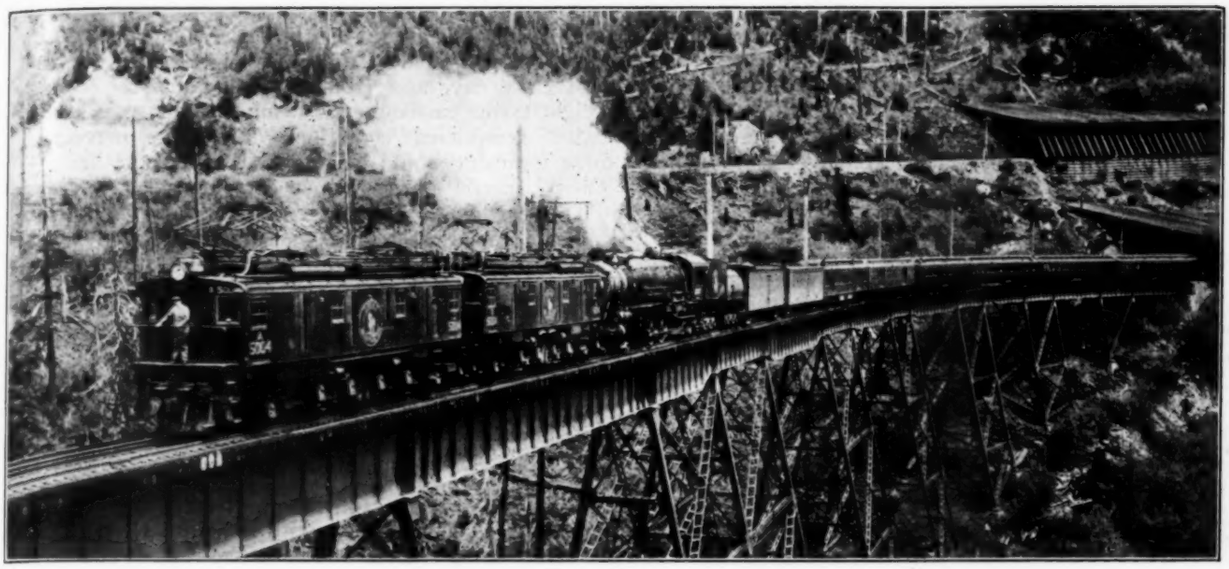
The present situation with respect to railway regulation is a grotesque one. There are numerous laws applying to the railways, and the Interstate Commerce Commission is the agency charged with administering and enforcing them. But the commission itself is disregarding, and, in effect, constantly violating certain very important parts of the laws which it is charged with interpreting and administering. It is easy to convict it of this because it is not even administerng them according to its own interpretation of them.

It is time to have a new deal in railway regulation. The railways should insist upon it and fight for it. They should no longer allow themselves to be made the victims of propaganda to the effect that they are being "guaranteed" certain returns while they are persistently failing to earn anything approaching the so-called "guaranteed" returns.

Does the Interstate Commerce Commission intend ever to let the railways earn a fair return? If not, why not? If so, when does it intend to begin? Railway managers and investors should insist upon answers to these questions. Billions of new capital have been invested in the railroads within recent years upon the assurance and assumption that a certain policy of regulation would be followed. It has not been followed. It is not being followed. If it is not to be followed in future railway managers and investors should be so informed in order that they may chart their course accordingly.

The British Railways and Highway Competition

IN the cabled news from London published in the daily papers there has been in the past few weeks much comment on the acute competition the British railways are experiencing from highway transport. Without attempting to minimize the seriousness of this situation for the railways—it is bound to be so in a highly populated country with short distances—there is at least one phase of the situation which is decidedly in the railways' favor. This is the recent passage of legislation granting, with few restrictions, to the four leading railways charter authority to enter into the highway transportation field in their own respective territories. Thus they may, and probably will, if independent motor transport competition becomes too serious, themselves become important users of the highways. If they do this—and there is no reason to believe that they would have put up the fight necessary to secure the passage of permissive legislation unless such was their intention—then a carefully ordered co-ordination of rail and highway transportation in Great Britain should result. Much has appeared in the daily papers about sleeping-car motor coaches operating long distances over British highways. Less has been said of a similar motor coach, with sleeping accommodations for 26 passengers, which has been developed by an independent operator on our own Pacific coast. Motor competition in Great Britain is undoubtedly serious. At least, however, a start toward co-ordination has been made by the legislation placing the railways on an equal footing with other highway operators. And, in this respect, the British railways' position is better than that of the American companies. American railroad men, railway patrons who desire a continuation of good railroad service and the millions whose savings are, directly or indirectly, invested in railroad securities should have this problem placed clearly and emphatically before them. They can then decide whether the question is one of sufficient merit to warrant their questioning candidates for Congress as to their views on interstate motor transport regulation.



Great Northern Passenger Train Moving Over the Electrified Section

Performance of Motor-Generator Locomotives

Great Northern employs operating methods which take full advantage of this new type of motive power

By P. A. McGee

General Engineering Department, Westinghouse Electric & Manufacturing Company

THE Great Northern electrification represents an exacting application of the motor-generator, electric locomotive. The officials of the Great Northern selected this particular type on the basis of its general characteristics and wide range of operating speed. The locomotives referred to in this article were built jointly by the Baldwin Locomotive Company and the Westinghouse Electric & Manufacturing Company. They were described in the *Railway Age* of September 24, 1927.

The motive power-units which may be assembled in combinations of two, three or more units per locomotive, are of the Mikado wheel arrangement with outside axle boxes on all axles. The 1-D-1 wheel arrangement has its four driving axles held in a rigid wheelbase. The guiding trucks are of the two-wheel radial type with heart-shaped links. The center casting upon which the motor-generator set is directly mounted is cast in one piece and supplies an extremely solid member to support the major locomotive apparatus and transmit the traction stresses.

The electrical equipment of each unit, which consists essentially of a transformer, a motor-generator set and the traction motors with the usual auxiliary and control apparatus, is arranged to specially develop the possibilities of the motor-generator type locomotive. The inherent feature of voltage control has been supplemented by the use of insulated secondary circuits, the utilization of 600-volt traction motors fed in parallel from a common bus, and by closed-circuit transition from series traction motors to separately excited traction motors. This latter feature permits the locomotive to be operated with three distinct characteristics as follows: (a) Series motor characteristic having falling speed with increased tractive effort. (b) Shunt motor characteristic with practically constant speed over a large range of tractive effort. (c) Varying field characteristic with constant horsepower output over a large range of speed.

The constant horsepower output characteristic is obtained by the gradual weakening of the traction motor fields and it is essential for the complete development of this feature that the most stable design of traction motor be employed.

On the Great Northern motor-generator locomotives, constant horsepower output can be maintained between 15 m.p.h., and 33 m.p.h. The operating results obtained with this locomotive characteristic are far reaching. The fastest schedules are secured with a given power demand. High efficiency is obtained for both the locomotive and distribution apparatus as they are worked to their rated capacity during the whole period of operation. A corresponding development with the steam locomotive is obtained with the increase in fire-box and boiler sizes requiring four-wheel trailing trucks.

Four Baldwin-Westinghouse motive power units assembled in pairs to operate as two locomotives were delivered to Skykomish, the Western termination of

the existing electrification, in January 1927, and have been in regular service since February 6, 1927.

The profile shows the existing electrified line between Skykomish and Cascade tunnel, a distance of 25 miles, with 21 miles on a 2.2 per cent compensated grade and 3 miles on a 1.7 per cent grade through Cascade tunnel.

General Dimensions of a Two-Unit Locomotive

Total weight	715,000 lb.
Classification of wheels	2 (1-D-1)
Weight on drivers	549,600 lb.
Number of driving axles	8
Number of idle axles	4
Capacity at one hour rating	4,330 hp.
Starting tractive effort, 25 per cent adhesion	137,400 lb.
Maximum starting tractive effort, 33 1/3 per cent adhesion, limited by adhesion	183,200 lb.
Tractive effort—hourly rating	112,500 lb.
Speed—hourly rating	14.4 m.p.h.
Tractive effort—continuous rating	88,500 hp.
Speed—continuous rating	15.5 m.p.h.
Maximum speed	37.5 m.p.h.
Track gage	4 ft., 8-½ in.
Total wheel-base	78 ft., 6 in.
Rigid wheel-base	16 ft., 9 in.
Length over-all (between faces of buffers)	94 ft., 4 in.
Width over-all	11 ft., 0 in.
Height from rail to locked position of pantagraph	15 ft., 10 in.
Diameter of driving wheels	56 in.
Voltage and type of conductor	11,000-volt, 1-phase, 25-cycle, overhead
Number and type of motors	8 Westinghouse 356-A
Method of drive	Double flexible gear
Gear ratio	18:91
Type of control	Westinghouse HBFR

The line from Scenic to Cascade and Berne will be discarded when the new 7-¾-mile tunnel between Scenic and Berne is completed at the end of the present year. The electrified section on the completion of the new tunnel will extend between Skykomish and Wenatchee, a distance of 73 miles. The single phase, 25-cycle power supply to the existing electrified line is obtained from the Tumwater hydro-electric plant located on the eastern side of the mountain and from the Puget Sound Light & Power network through a frequency changer station located at Skykomish. Single-phase, 44-kv. lines extend between Tumwater and Skykomish and the 11,000-volt contact line is fed through three distribution stations located at Skykomish, Scenic and Cascade. The whole distribution scheme and contact system was initially arranged to facilitate extensions and provide the simplest possible layout. When the lines are extended to Wenatchee, a frequency changer station will be installed at that point and the necessary distribution stations will be installed on the eastern side of the mountain.

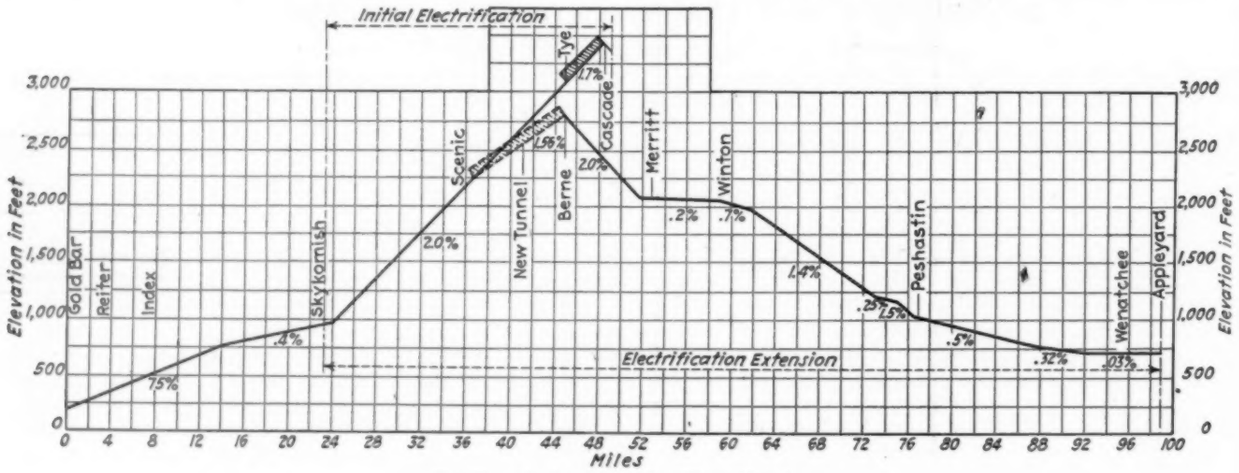
Normal traffic on the Cascade division under steam conditions consisted of three passenger trains east and west each day, and from two to four full tonnage freight trains eastbound. During the tourist season or under exceptional conditions of freight movement, these numbers would be increased and there are frequently special express trains carrying silk.

The eastbound freight trains from Skykomish to Wenatchee weighed 2500 tons and were drawn by a Mikado leading engine with two simple Mallet helpers, one about 30 cars from the front end and one near the rear end of the train.

These engines had the following wheel arrangement and weights:

	Mallet Helpers	Mikado
Wheel arrangement	2-6-8-0	2-8-2
Weight on drivers	350,000 lb.	244,000 lb.
Total weight of engine and tender	522,800 lb.	468,300 lb.
Tractive force	78,360	66,000

With a 2500-ton train, the gross total weight including engines was 3256 tons with 944,000 lb. on the locomotive driving wheels, which on the 2.2 per cent grade gave a coefficient of adhesion of about 18 per cent. The engines were capable of developing this tractive effort at approximately 7 miles an hour. At the western end of the Cascade tunnel, the two Mallet helpers were cut out and replaced with four 3-phase electric locomotive cabs operated in two-unit formation. With the assistance of one Mallet helper the train was accelerated and drawn through the Cascade tunnel on the 1.7 per cent grade at 7 m.p.h. by the old three phase electric engines taking power from a double contact system.



Profile of the Cascade Electrification

The total running time between Skykomish and Cascade was between 4-½ hr. and 5-½ hr., including time to take water at Scenic and time to cut in the electric engines at Tye.

The foregoing schedule operated regularly, and even with the disadvantage of changing the motive power at Tye the operating cycle was very efficiently performed.

The successful transportation of 4000-ton test trains eastbound over the 2.2 per cent grade demonstrated the feasibility of such train sizes and as a result of traffic studies, it was decided to arrange the electric motive power for 2800-ton trains eastbound with a possible increase to 3500 tons or even 4200 tons. The electric motive power units are each rated to transport 700 tons on a 2.2 per cent grade continuously so that multiples

of this unit can be arranged for the train sizes specified. For the initial operation, two locomotives are arranged to operate in two-unit combinations with 2800-ton trains. With operation through the new tunnel probably 3500-ton trains will be run eastbound requiring a three-unit helper with a two-unit head end engine. With the trailing loads specified, the coefficient of adhesion with the electric engines is a little under 16 per cent on the 2.2 per cent grade. This tractive effort can be developed at 15.5 m.p.h.

Present Method of Operation

Immediately upon the completion of the contact line to Scenic on February 6, 1927, the two electric locomotives were used as helpers to this point. This operation continued until March 5 when the contact system was completed through the existing three-mile tunnel to Cascade. The change from steam to electric operation was relatively simple, but the transition from a three-phase contact system insulated for 6600 volts to a single-phase contact system of 11000 volts required considerable temporary construction in the yards at Tye and at Cascade, and the employment of special narrow pantagraph horns on the locomotives for operation through the tunnel. At about 2 a.m. March 5 the last passenger train was hauled through the tunnel with three phase motive power. Shortly after midday on the same date, the first eastbound passenger train was hauled by the single phase locomotive and since that date, with the exception of some temporary interruptions because of power lines, all eastbound trains have been transported by the single-phase locomotives.

For the first few months, freight trains over the electrified section were made up of 2600 tons including the Mikado steam locomotive running on a drifting throttle. The head electric locomotive was coupled to the steam locomotive and the second electric acted as a pusher behind a caboose having a specially strong underframe. The effective weight of this train was between 2800 and 2900 tons. The run between Skykomish and Cascade was performed in one hour and forty-five minutes where meets were not encountered. During the initial operation to Scenic, the railway operators became familiar with the ease with which the electric locomotives could be coupled in on a train hauled by steam locomotives adjusted to take any proportion of load desired. Capitalizing on this experience, it was decided to increase the train weight and make the Mikado steam locomotive develop the maximum tractive effort possible at a speed of 15 m.p.h. without the necessity of replenishing its water tank at Scenic. After a few test trains, it was found that 3500-ton trains could be hauled on the 2.2 per cent grade with the combined steam and electric motive power without exceeding the continuous rating of the electric locomotives. The two electric locomotives, of course, take the complete train with Mikado steam locomotives through the Cascade tunnel on the 1.7 per cent grade. This has been the normal freight train make up since last October.

With the progress in the drilling of the new Scenic Berne tunnel, the demand for power had increased to a point where the general economics of power supply to the railway required a curtailment in the combined traction and tunnel drilling load demand. This requirement was met by merely instructing the engineers to reduce their speed to conform to a given demand indicated on their main synchronous motor ammeter. This restriction was confined to freight train movement and does not affect passenger traffic.

In passenger service trains do not exceed 1200 tons and are generally much less than this weight. The mountain type steam locomotive with tender which takes passenger trains from Seattle to Wenatchee weighs over 300 tons and when hauled in the train on its drifting throttle, adds considerably to the weight of the passenger train. The established schedules, however, can be maintained easily under all conditions.

Prior to the introduction of the 3500-ton freight train, three freight trains were run eastward per day on four or five days a week. To haul the three freight trains and three passenger trains per day with two locomotives required close dispatching of freight trains, and required the locomotives to be available for practically continuous service. The daily schedule of electric locomotives with this train movement was as follows:

Run No.	Train	No. Engines	Time Leaving Skykomish	Round Trip Loco. Miles
1	Freight	2	3:30 A.M.	100
2	Freight	2	8:00 A.M.	100
3	Passenger	1	11:30 A.M.	50
4	Freight	2	4:00 P.M.	100
5	Passenger	1	10:30 P.M.	50
6	Passenger	1	11:30 P.M.	50
Total Locomotive Miles per day				450

A round trip took between 3-½ hr. and 5 hr. where long meets were not encountered. With the speed limited to 15 m.p.h. on the up-grade in freight service and to approximately 20 m.p.h. in passenger service, the mileage performed by the electric locomotives is quite remarkable. In certain months, the locomotives ran approximately 6000 miles and for the twelve months ending March, 1928, the locomotives had each run more than 50,000 miles. For nine months these two locomotives maintained the complete service over this important grade and they continue today to carry eastbound 80 per cent of the revenue ton-miles on this section.

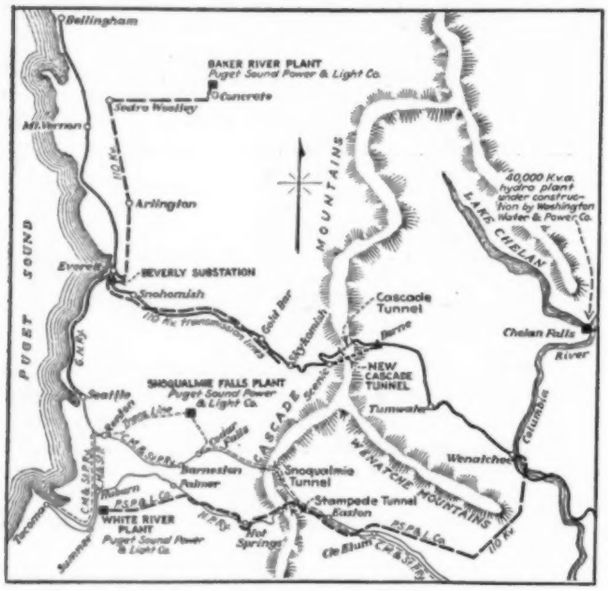
The reliability of these engines is shown by their mileage record. The ease with which they can be made to regenerate and their adaptability to unusual and exceptional conditions has been well demonstrated during their first twelve months of operation.

Regenerative Braking

Regenerative control with westbound trains is used on all possible occasions. This control, apart from the economies introduced with returned power and saving of wear and tear on equipment has resulted in a method of control on the down grade which approximates the advantages of electric traction on the up-grade. With the motor-generator locomotives, it is possible to reduce the speed of freight train on the 2.2 per cent grade from normal running speed to 2 m.p.h. under regeneration and without the use of air brakes. A two-unit locomotive can control a 2500-ton train down the 2.2 per cent grade without the use of air. Two two-cab locomotives can control, from the head end, the maximum size train that it would be desirable to take in compression. Due to the favorable speed torque characteristic of the motor-generator locomotive, combined air and regeneration can be employed easily when the train weight exceeds the permissible load on the engine. Numerous tests indicate that between 30 and 35 per cent of the energy required to raise a given train weight may be returned on descending the grade.

A simple flexible catenary system is installed with inclined construction on curves and each locomotive normally employs two pantagraphs. No pantagraph has ever been damaged by misalignment of the system. A very heavy snow condition is experienced during

winter which builds up on the pantagraph moving parts and reduces considerably the normal pantagraph pressure with resulting sparking at the wire. This condition of poor contact has not affected the single phase synchronous motor. Considerable lengths of ice covered contact wires have been encountered with consequent sparking at the collecting strips but without any effect on the synchronous motor. Sudden drops in contact voltage due to failure of regulating devices in sub-



Map Including the Electrified Section

station occurred during initial operation and caused the protective devices in the locomotives to function and super-excite the synchronous motor field and warn the engineer to reduce speed. Engineers readily learn to interpret low voltage conditions and continue to operate their locomotives to the maximum speed permissible under the conditions of power supply.

Uniform Tractive Force

An operating feature of the locomotives which is considered by the operating officials and engineers as of great value is their ability to develop the required tractive effort with a mimimum slipping of wheels. The reasons for this desirable characteristic are, the good weight distribution, almost complete absence of weight transfer, the type of control which permits the finest graduation in accelerating steps, the permanent parallel connection of traction motors to common bus bars and the closed circuit transition from series to separately excited motor operation. While accelerating trains the engines can develop unusually high coefficients of adhesion and any tendency to slip which occurs is not accumulative so that there is a complete absence of the shocks and wear and tear which occurs with violent slipping.

Due to the tendency of motors to shed their load on slipping, it is found that the locomotives operating on greasy rail can develop, while slipping, a much higher sustained tractive effort than is commonly experienced with other locomotives. Without the use of sand and on a rail covered with oil drip from the snow shed roofs the locomotives have maintained a well sustained tractive effort corresponding to 13 per cent adhesion while all wheels slipped at apparently a uniform rate. This condition was experienced over many miles of track both while motoring and regenerating. The two locomotives under abnormal conditions of operation and without assistance from the steam locomotive, have taken the 3500-ton train over many miles on the 2.2 per cent grade eastbound.

Maintenance on these locomotives consists primarily of the necessary force to inspect and clean the apparatus. Because of the combined steam and electric operation through the many short tunnels and snow sheds, it is necessary to pay special attention to the blowing out and cleaning of the electrical apparatus. The mechanical maintenance is practically limited to lubrication and supplies. Due to the extensive use of regenerative braking, there is little brake shoe wear and extremely small tire wear. Although the track alignment between Skykomish and Tye is practically a continuous series of curves with much 10-deg. curve, the amount of flange wear on the outer tires has been unusually small. Fifty thousand miles were run before the outer wheel tires were turned for flange wear. As this mileage was confined entirely to mountain grade curve track, exceptionally good mileage between tire turnings may be expected when the line is complete to Wenatchee.

Relation of Operating Methods to Power Demand

The question of power supply and maximum demand has already been referred to. Economy in railway operation requires large freight trains. Where few trains are operated and the length of electrified track is limited, this condition is apt to cause a poor load factor. Careful dispatching of trains is required to keep down peak power demands. There are, however, obvious limitations to what can be accomplished in this direction. It is believed that the motor-generator type locomotive with constant horsepower output over its normal range of operating speed, and in necessary cases with graduated speed control to suit any desired power demand, can be more readily employed to keep down abnormal peaks than any other type of freight locomotive. The local operating force on the Cascade division has given careful consideration to the question of power demand and has decided that as far as practical it is desirable to dispatch trains so that the amount of motive power moving on the up grade is limited to that required by one maximum train.

In order to permit such train dispatching, it is essential that trains be moved as rapidly as possible over all grades less than the ruling grade and that the speed on this ruling grade be limited by the economical maximum power demand for the system. In view of the time margins which would have to be employed to insure that a train has passed over a particular section of grade, little advantage can be taken of the reduction in load which might result on the section of track approaching the maximum grade. Having settled on a permissible maximum power demand, it is found profitable to use it to get the train quickly over the grade and justify holding back trains at the grade starting point so as to permit full speed operation when the train is in motion. This can be very clearly followed by considering the conditions shown by the profile.

A 3500-ton drag-freight over the new profile between Skykomish and Berne will travel at a speed of 15.5 m.p.h. between Skykomish and Scenic with one two-unit electric locomotive and one three-unit electric locomotive taking a constant power of 9400 kw. This demand will last for 48 minutes. Between Scenic and Berne

through the new tunnel on the 1.5 per cent grade, the train if operated with the conventional series motor characteristic would run at approximately 17 m.p.h. with a load of 7700 kw., lasting for 28 minutes, whereas with the use of separate excitation and taking a power demand of 9400 kw., the speed may be increased to 21.5 m.p.h. and the run will be completed in 22 minutes. On the grade between Peshastin and Winton, with westbound movement, the saving in time becomes considerable.

It should be noted in any analysis of the running time and duration of power demand which may exist with any system that the speed of operation of the motor-generator locomotive is independent of the normal variations in line voltage and in this respect the runs under any given condition of load and power demand will be completed in from 10 to 50 per cent less time than a motor which normally requires the full contact voltage for the development of its maximum power.

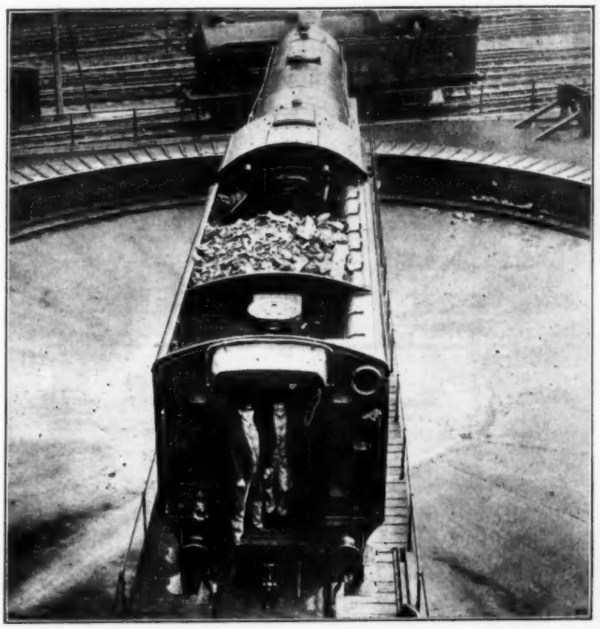
Six duplicate Baldwin-Westinghouse locomotive units have been ordered, four of which will be delivered this summer. To the Great Northern operating department is due the credit of having taken this new type of locomotive and placing it in most exacting service from the day of its initiaton. The monthly mileage run with these locomotives where the haulage speed in freight service is limited to 15.5 m.p.h. compares favorably with electric locomotives on high-speed runs. It is by such use of electric locomotives supplemented with systematic inspection and overhaul that electrification of main line railways may be made to show a satisfactory return on the invested capital.

Locomotive Tender with Corridor on the L. & N. E.

THE London & North Eastern (England) placed in service on May 1, 1928, two tenders provided with side corridors for service behind the locomotives that haul the "Flying Scotsman" and the "Royal Lancer," two crack trains that make non-stop runs between King's Cross (London) and Edinburgh, Scotland. The locomotives equipped with these tenders are of the three-cylinder 4-6-2 type. Eight other locomotives of the same class are to be similarly equipped. The reason for this design is to permit relief of the engine crew as the train passes Tollerton, which is 197½ miles from King's Cross, or approximately the half-way point between King's Cross and Edinburg. The relief engine crew rides in the forward compartment of a third-class coach, which is placed in the train next to the locomotive. Arrangements have been made, on reaching Tollerton, for the engine crew in the third-class coach to pass through the side corridor in the tender, and relieve the crew in the cab while the train is still in motion. The men relieved pass back to the train by the same route.

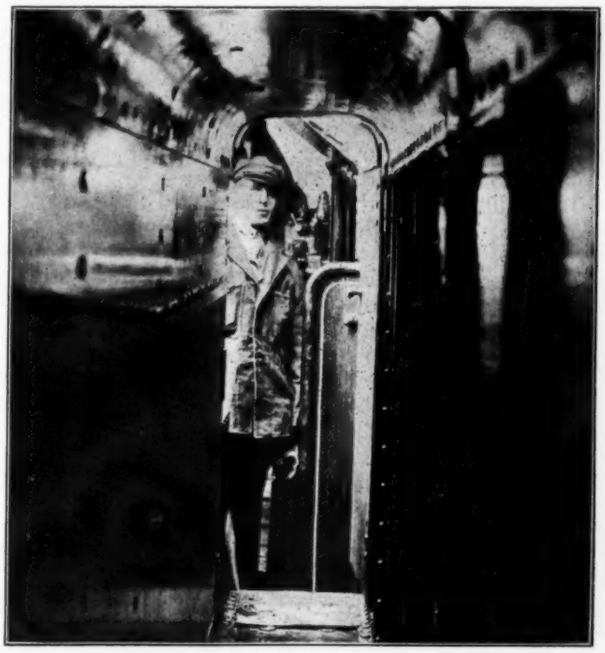
Circular windows are provided at each end of the corridor for lighting the interior, as shown in one of the illustrations. The corridor has a width of 18 in. and a height of 5 ft. Steps leading up to the floor of the corridor are provided at each end. The rear of the tender is equipped with a vestibule so that the engine crew can walk, with safety into the forward compartment of the third-class coach.

The tender is carried on eight wheels, the axles and journals of which are in a rigid frame, extending the entire length of the body structure, as is common in European practice. It formerly had a coal capacity of



The Corridor Leads from the Cab to a Vestibule on the Rear of the Tender

nine tons, but the space occupied by the corridor has reduced this to eight tons. Provision has been made whereby additional weight has been added to the side of the tender below the corridor to counteract the lack

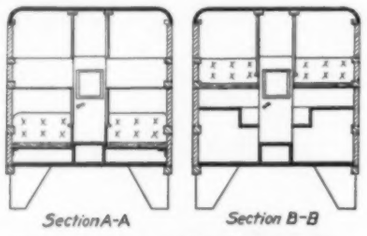


Inside View of the Corridor Looking Toward the Cab

of balance, due to the empty space. The run made by the "Flying Scotsman" and "Royal Lancer" of 392.7 miles, between London and Edinburgh, is said to be the longest non-stop railroad run in the world.

Semi-Double-Deck Railroad Coach

THE illustrations show a design of a semi-double-deck railroad coach that will accommodate a maximum number of passengers in comfort for a given car length. The car is primarily designed for commuting service.



Cross-Sections of Upper and Lower Seating Deck

The design provides seats on two levels, but so arranged and disposed that the seats on either level can be reached from a common central longitudinal aisle, which is raised above the level of the floor on which rest the lower seats. In other words, passengers step down from the aisle to the lower seats and step up from the aisle to the upper seats.

Seats Are in Vertical Alignment

The upper seats are in vertical alignment with the lower seats, but faced in the opposite direction, and both the upper and lower seats are in pairs facing one another.

With this arrangement, the feet of the seated upper passengers are considerably lower than the heads of the seated lower passengers. This arrangement results in a minimum vertical distance between the floor of the upper seats and the floor of the lower seats. It is because of this that it is possible to so place the aisle between the two floors that each can be reached from it by either one or two steps.

In the illustration, the aisle is so placed that the lower seats are reached with one step and the upper seats by two steps. This process can be reversed or the aisle could be so placed that both the upper and lower seats could be reached with one step. In this case, however, the steps would be deeper, but not too deep for practical use.

This design of coach does not require any change in the present floor height of railroad coaches, nor in their total over-all height.

A. E. Hutt, New Rochelle, N. Y., has designed and holds the basic patents on this type of passenger coach.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading during the week ended August 25 amounted to 1,080,840 cars, an increase of 23,935 cars over the total in the preceding week and a decrease of 28,501 and 47,723 cars respectively as compared with loading in the corresponding weeks of 1927 and 1926. Loading of one and miscellaneous freight was larger than a year ago, the former being 67,007 cars as against 63,831 cars and the latter 442,627 cars as compared with 416,798 cars in the corresponding week of last year. Coal loading, with a total of 173,098 cars, was 21,870 cars lower than in the corresponding week of 1927. Loading in the Central Western and Southwestern districts was larger than a year ago. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, August 25, 1928

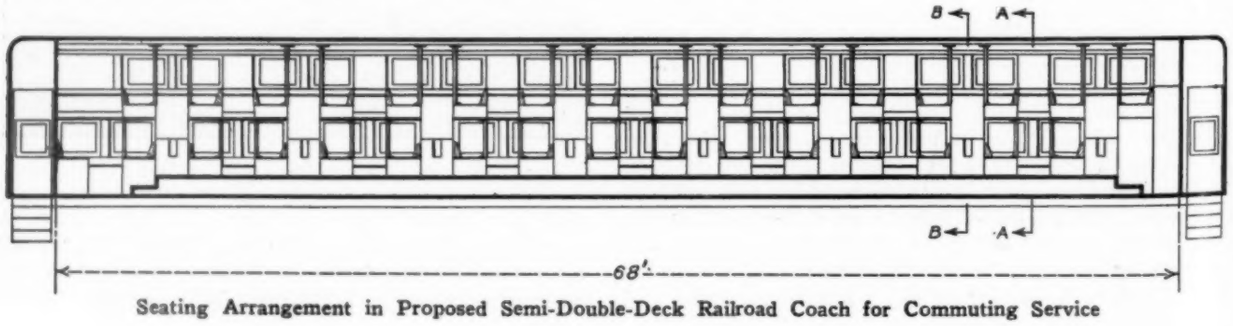
Districts	1928	1927	1926
Eastern	249,471	250,535	257,421
Allegheny	219,804	221,932	227,578
Pocahontas	56,905	65,111	61,793
Southern	141,183	158,469	150,930
Northwestern	168,857	175,189	183,087
Central Western	160,725	155,370	166,700
Southwestern	83,895	82,735	81,054
Total Western Dists.	413,477	413,294	430,841
Total All Roads	1,080,840	1,109,341	1,128,563
Commodities			
Grain and Grain Products	56,180	60,842	55,695
Live Stock	26,906	30,190	31,166
Coal	173,098	194,968	200,946
Coke	9,341	10,078	11,699
Forest products	67,438	69,990	71,003
Ore	66,007	63,831	80,480
Mdse. L.C.L.	257,243	262,644	263,950
Miscellaneous	424,627	416,798	413,624
August 25	1,080,840	1,109,341	1,128,563
August 18	1,056,905	1,066,828	1,081,503
August 11	1,044,442	1,049,639	1,102,660
August 4	1,048,622	1,024,038	1,075,392
July 28	1,033,976	1,044,697	1,095,997
Cumulative total	32,630,845	33,684,647	33,869,468

The freight car surplus averaged 226,882 cars during the period ended August 23, as compared with 241,258 cars on August 15. The total included 119,293 box cars, 64,331 coal cars, 19,962 stock cars and 13,802 refrigerator cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended August 25 totalled 70,875 cars, an increase of 2,144 cars over the previous week and an increase of 6,835 cars over the same week last year.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
August 25, 1928	70,875	39,343
August 18, 1928	68,731	39,886
August 11, 1928	66,243	38,268
August 27, 1927	64,040	38,162
Cumulative Total for Canada		
August 25, 1928	2,207,185	1,325,151
August 27, 1927	2,069,595	1,287,673
August 28, 1926	1,960,693	1,264,870

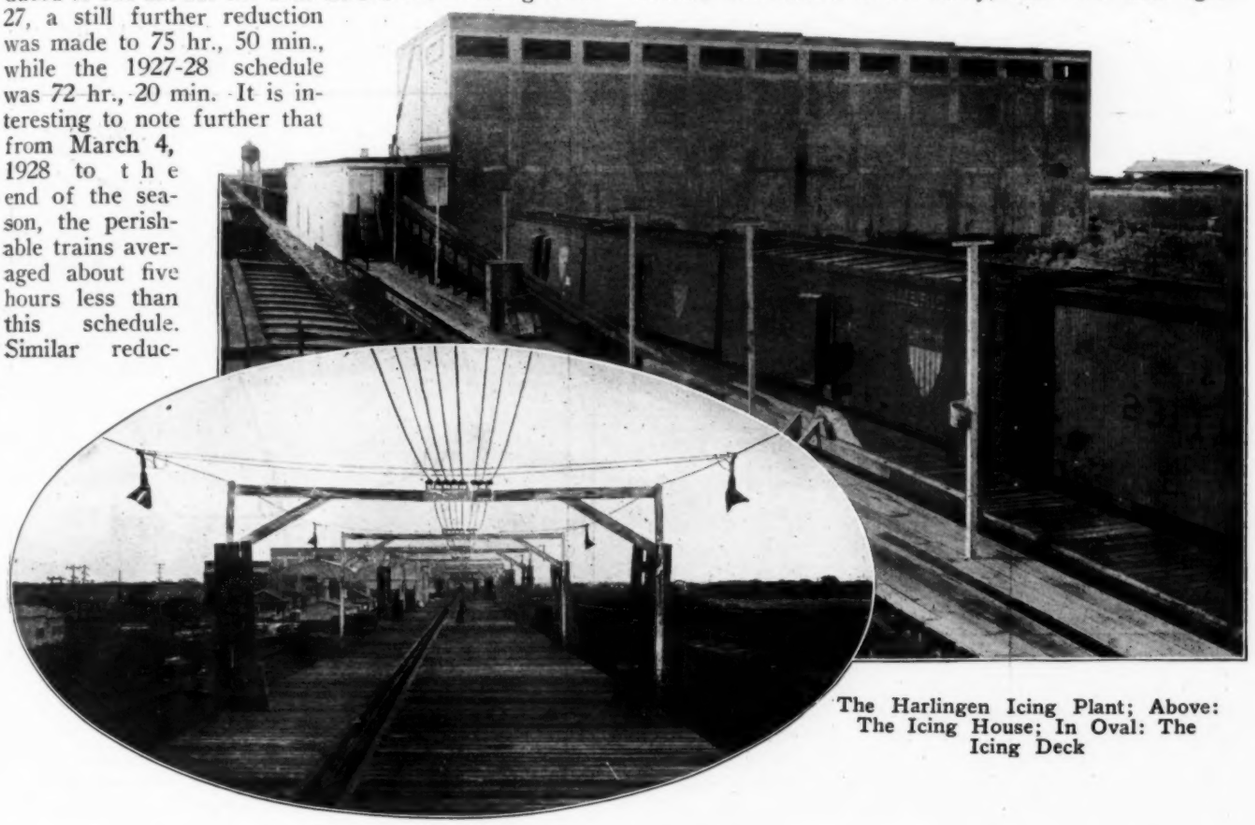


Seating Arrangement in Proposed Semi-Double-Deck Railroad Coach for Commuting Service

Missouri Pacific Stimulates Agricultural Progress

Efficiency in getting perishables to market aids development of irrigated regions in South Texas

THE advantages of unified and co-operative control of transportation in the handling of perishables are well illustrated by the development of certain farming areas in South Texas since the Missouri Pacific took over the Gulf Coast Lines, the San Antonio, Uvalde & Gulf and several smaller lines. From a more or less uncertain schedule, the time in transit from Harlingen, Tex., to St. Louis, Mo., 1,181 miles, was reduced to 118 hr. for the 1925-26 season. During 1926-27, a still further reduction was made to 75 hr., 50 min., while the 1927-28 schedule was 72 hr., 20 min. It is interesting to note further that from March 4, 1928 to the end of the season, the perishable trains averaged about five hours less than this schedule. Similar reductions were made on perishables moving via the Kansas City gateway. Schedules from Laredo, Tex., and the Winter Garden district southwest of San Antonio have been correspondingly shortened until the time from Laredo to St. Louis, 1,076 miles, is now 83 hr.



The Harlingen Icing Plant; Above: The Icing House; In Oval: The Icing Deck

The results of this are illustrated by comparative figures, which show that, for the season of 1922-23, the perishable movement from the Rio Grande Valley amounted to 3,462 cars, as compared with 14,664 cars for the 1926-27 season and 16,285 cars this year.

The Lower Rio Grande Valley

The territory known as the "Valley" comprises Cameron, Hidalgo and Willacy counties, with small portions of other counties, situated in the southernmost part of Texas. It forms a triangle, with the Gulf of Mexico and the Rio Grande as two of its sides.

This territory produces a wide variety of winter vegetables, besides citrus fruits, cantaloupes and watermelons. The movement of cabbage alone averages about 5,000 cars per year; mixed vegetables, 3,500 cars; beets, 1,200 cars, and potatoes, 1,000 cars. Among the other produce shipped are lettuce, onions, carrots, green corn, spinach, tomatoes, turnips and cucumbers.

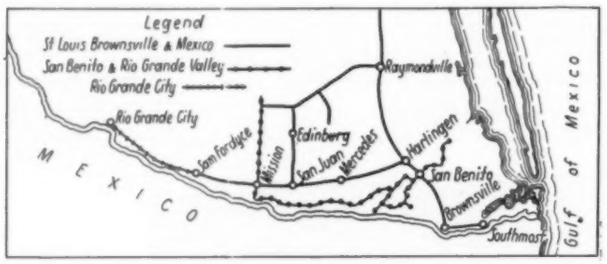
Prior to 1904, when the St. Louis, Brownsville & Mexico was built into the valley, there was little agricultural development. Small fields of corn, sorghum and cotton had been cultivated and some sugar cane was grown, under a primitive system of irrigation. Certain small tracts had been planted in vegetables, the results demonstrating that vegetable growing would be profitable, if the markets were available.

With the coming of the St. L. B. & M., however, the territory began to progress as a fruit and vegetable-producing center. Modern irrigation projects were undertaken and met with such success that they grew rapidly. In 1903, for example, there were fewer than 5,000 acres under cultivation, as compared with nearly 300,000 acres at present. The capital invested in irrigation plants increased more than seven million dollars in the 10 years between 1910 and 1920, and this increased investment continued proportionately, until about five years ago, when the rate of increase became

more rapid, attributable, in a large measure, to the improved transportation service rendered.

The population was somewhat less than 25,000 in 1903, while the assessed values on property were $5,720,842. Now the population is 250,000, while the assessed value of property was $77,064,001, in 1926, and has increased materially since then.

One of the features in the development of the valley has been the growth of the citrus fruit industry. A citrus nursery was established near Brownsville as early as 1904. However, several years were required to ascertain what varieties and root stock were adaptable to the delta soils. For this reason, it was not until 1923



How the M. P. Serves the Lower Rio Grande Valley

that the planting of citrus became extensive. Since 1925, it is estimated that the citrus acreage has been increased to 60,000 acres. Citrus is planted 70 trees to the acre, so that there are about 4,200,000 trees in the valley at the present time. The growth of the movement is indicated by Table 1. Since the larger percentage of the groves are young, many of them having not yet reached the bearing stage, the movement should continue to increase rapidly.

Table 1.—Citrus Movement—Lower Rio Grande Valley

Season	Lemons	Oranges	Grape Fruit	Mixed Citrus Fruit	Total
1921-22*	0	1	7	5	13
1922-23	0	0	44	7	51
1923-24	1	0	107	7	115
1924-25	1	1	508	11	521
1925-26	0	1	290	0	291
1926-27	0	11	706	39	756
1927-28	0	27	900	88	1,015

* No movement prior to 1921-22 season.

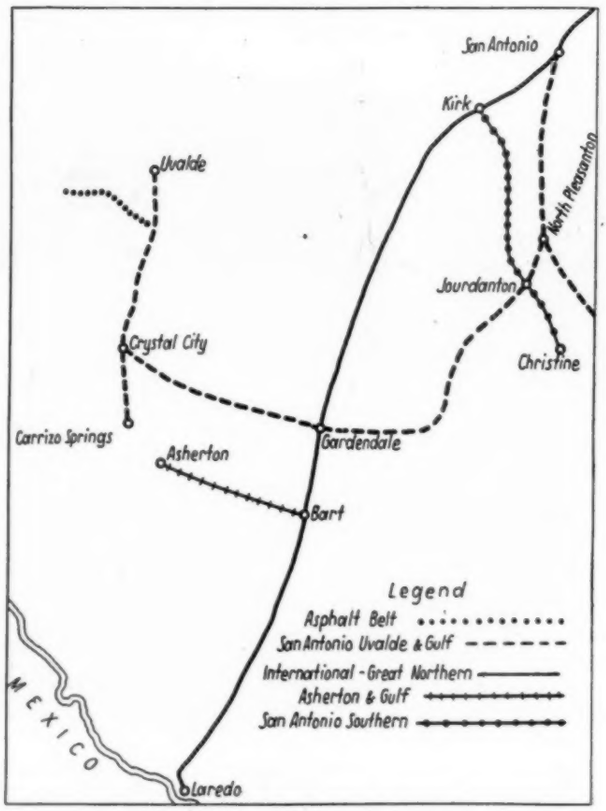
Before the Missouri Pacific acquired control of the lines serving the valley, they had undergone several changes in management and there was not as much cooperation among them as might have been desired. It was a difficult matter to arrange satisfactory schedules with the lines north of Houston and the service was not always sufficient to meet the demand.

When the Missouri Pacific took over the Gulf Coast Lines, including the St. L. B. & M., much of this difficulty was eliminated. The M. P. purchased the San Benito & Rio Grande Valley, an independent property about a hundred miles long, which serves the heart of the district. Numerous gathering lines and branches were also built, until now the M. P. owns and operates 305 miles of main track in the valley, with several miles still under construction. There are now 101 loading stations on these lines, with a total daily capacity of 3,350 cars.

Operations in the "Valley"

The car supply and icing of this movement is taken care of by the American Refrigerator Transit Company. The problem of car supply, when the Gulf Coast Lines were entirely dependent upon their own resources, was acute at times. Now, however, under the consolidated management and the system car handling plan followed by the Missouri Pacific, a sufficient supply of empty cars is assured. A concentration of empties, based upon estimates of the volume of early shipments, is made immediately prior to the opening of the shipping season. Thereafter, the flow of empties into the valley is constant, fluctuating as the demand increases or decreases. Usually, these empties are brought from Houston as fill-outs on regular trains, but when the season is at its height, solid trains of empty cars are sometimes run. Normally, the supply is a step or two ahead of the demand. In order not to interfere with the loaded movement, empty cars not required immediately are set out at Kingsville or Raymondville, north of the producing territory, where they are readily available. Harlingen serves as the principal concentration point for loads and distribution point for empties. The facilities at that point include an icing station, with a capacity of 10,000 tons and a yard with a capacity of 1,980 cars.

Two set-out and pick-up crews operate between Harlingen and Mission, one leaving Harlingen at mid-



The Winter Garden Territory

night and having all the empties set out before 7 a. m., the other leaving at noon and setting out its empties by 7 p. m. Two crews are also operated out of San Benito, where there is an icing station with a capacity of 6,750 tons. One of these crews serves the Rio Hondo branch, while the other serves stations on the San Benito & Rio Grande Valley between San Benito and Mission. Another crew operates between Raymondville and Edinburgh, serving the northern section of the valley. The branch to Southmost is handled by switching service out of Brownsville.

The number of perishable trains operated is dependent, of course, on the amount of business to move.

Normally, however, a train leaves Brownsville each morning. This train picks up at intermediate points between Brownsville and Harlingen, clearing San Benito of all cars brought in from the S. B. & R. G. V. If necessary, this train fills out at Harlingen to the required tonnage and proceeds northward as a through train, leaving Harlingen at 6:40 a. m. It is followed, at 7:45 a. m., by a train made up at Harlingen, which picks up cars as far north as Raymondville, becoming a through train north of that point. Additional trains are run as advance sections of these two trains, when there is a sufficient amount of traffic available.

Faster Schedules

The perishable trains are run as solid "fruit blocks" to St. Louis, being stopped only for icing and inspection enroute. As previously stated, the time has been reduced nearly 48 hr. in the past two years. In order that the reductions in time, as between the various points may be understood, the comparative schedules are shown in Table 2.

One of the important factors of this reduction in time was the installation of an icing station at Lexa, Ark., 86 miles north of McGehee, which enabled these trains to move via McGehee and Paragould instead of via Little Rock. This not only reduced the distance about 50 miles, but also enabled these trains to operate over secondary main lines for a large part of the journey, thus avoiding interference with the heavy winter tourist passenger travel on the main line. In addition, a plan of extended engine runs was adopted, which included running engines through from Harlingen to Houston, 347 miles, the average engine run for the entire distance between Harlingen and St. Louis being now about 250 miles.

Table 2.—Comparative Perishable Schedules

	Season 1925-26			
Lv.	Harlingen, Tex.*	7:00 a.m.	1st	day
Arr.	Alexandria, La.*	6:00 p.m.	3rd	day
Lv.	Alexandria	7:30 p.m.	3rd	day
Arr.	Little Rock, Ark.*	8:10 p.m.	4th	day
Lv.	Little Rock	3:15 a.m.	5th	day
Arr.	St. Louis, Mo.	5:00 a.m.	6th	day
	Season 1927-28			
Lv.	Harlingen, Tex.*	6:40 a.m.	1st	day
Arr.	Alexandria, La.*	5:30 p.m.	2nd	day
Lv.	Alexandria	6:30 p.m.	2nd	day
Arr.	McGehee, Ark.	4:35 a.m.	3rd	day
Lv.	McGehee	5:15 a.m.	3rd	day
Arr.	St. Louis (Dupo)	7:00 a.m.	4th	day

* Re-icing point, these trains also re-iced at Houston, Tex.

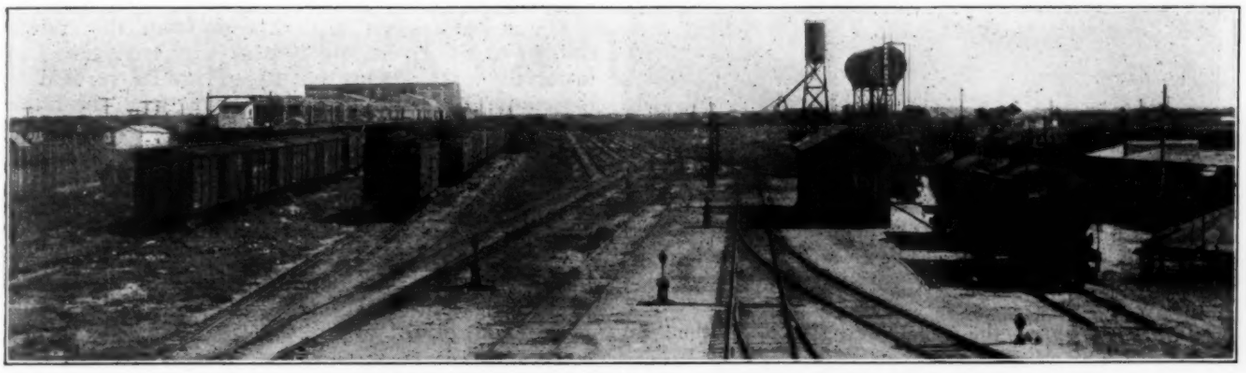
The Winter Garden Section

The Missouri Pacific has also acquired control of the San Antonio, Uvalde & Gulf, the San Antonio Southern and the Asherton & Gulf. These lines, with the International-Great Northern, serve another vegetable-producing section of Texas known as "The Winter Garden", which consists of Frio, Dimmitt and Zavalla counties, and small portions of adjacent counties. The International-Great Northern also serves a smaller vegetable-growing section in the vicinity of Laredo, Tex.

The principal products of this territory are onions, watermelons and spinach, each of which averages about 2,000 cars per year. The growth of the perishable movement is indicated by the fact that only 5,000 cars were shipped from the territory in 1917 as compared with 7,339 cars in 1927 and 10,305 cars to May 31, 1928.

Unlike the Valley, which receives its water supply for irrigation from the Rio Grande, this territory is supplied with water by artesian wells, ranging in depth from 500 to 2,500 ft.

The original development of this territory from a district of large cattle ranches to an intensive farming district, is due, in a large measure, to the enterprise and foresight of the builders of the San Antonio, Uvalde & Gulf. This line was built in 1909, from Uvalde, Tex., to Crystal City, 40 miles. Within the next few years, a branch had been built to Carrizo Springs and extensions made from Crystal City to San Antonio, via Gardendale, Fowlerton and North Pleasanton. This railway had the effect of opening up the territory for agricultural purposes, and the movement of perishables, particularly onions and onion sets, developed rapidly. The watermelon movement comes almost entirely from the San Antonio Southern, while a small movement of perishables originates on the Asherton & Gulf.



The Perishable Traffic is Consolidated at Harlingen Yard

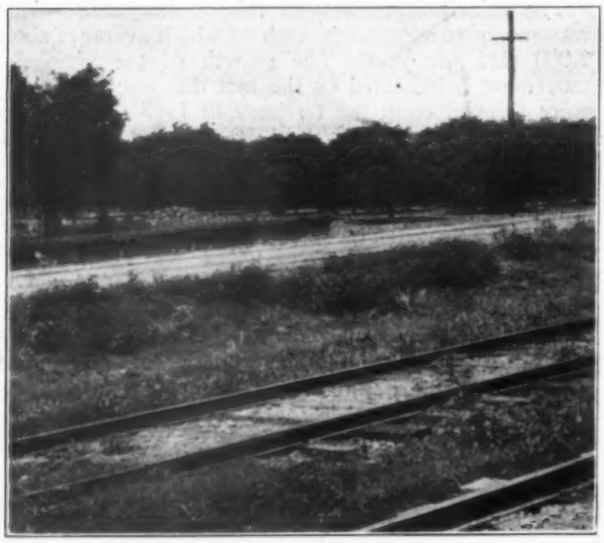
Operations in the Winter Garden District

During the season, through vegetable trains are operated from Laredo, Asherton, Crystal City and Corpus Christi via San Antonio to St. Louis. A vegetable train leaves Laredo at 9 p. m., with shipments from that point, from connections and imports from Mexico. This train operates over the main line of the I.-G.N., performing pick-up service enroute, there being eight principal shipping points along the line. Vegetables produced in the vicinity of Asherton and Catarina, on the Asherton & Gulf, are brought to Artesia by local crews, and the Laredo train picks them up there. This train arrives at San Antonio at 7:30 a.m.

The concentration point for the S. A. U. & G. producing territory west of Gardendale is at Crystal City. The freight is trucked in to that point and also brought in by yard engines from loading platforms in the

ity. The cars are re-iced and made up into special vegetable trains which operate into San Antonio via the S. A. U. & G. to Gardendale and I.-G. N. beyond. This train picks up cars at the loading spurs between Crystal City and Gardendale.

The vegetable territory between Corpus Christi and



A Grape Fruit Grove in Texas

Mathis, in the Nueces River valley, is served by a train leaving Corpus Christi at 10 p. m. which picks up cars from the entire district. These cars are re-iced at North Pleasanton and arrive at San Antonio at 8:30 a. m.

The majority of the vegetables grown on the San Antonio Southern, due to the proximity to San Antonio, are trucked into that market, the only special train service being for watermelons originating in the vicinity of Poteet. This movement begins June 1 and continues until July 20, amounting to 50 or 60 cars a day at its height.

All the vegetable train schedules are so arranged as to provide for early morning arrival at San Antonio. Here the trains are consolidated, the cars are re-iced, and move out at 9:10 a. m. in solid 55-car vegetable blocks, scheduled for arrival at St. Louis at 3 a. m., the third morning. The fruit and vegetable blocks are re-iced at Longview Junction, Tex., and Little Rock, Ark., enroute.

Icing stations are maintained in the producing territories at Crystal City, Laredo and North Pleasanton, in addition to the one at San Antonio.

Immediately following the other vegetable seasons, beginning about April 1, there is a heavy movement of onions from the Laredo and Crystal City territories. These are handled in the same manner as the other vegetable shipments, except that no icing is required. Therefore, the leaving time of the onion trains is somewhat later, to permit later loading time for the shippers

The schedules on fruit trains from the Winter Garden to St. Louis and Kansas City have also been materially reduced, by the use of similar methods to those adopted in cutting down the time from the Lower Rio Grande Valley.

The advantages of unified control of the movement from the producing territories to northern markets are well illustrated from both the Valley and the Winter Garden. It is an undoubted fact that much of the development which has taken place would have been impossible without the improvement in schedules and operating conditions brought about the adoption of this unified control.

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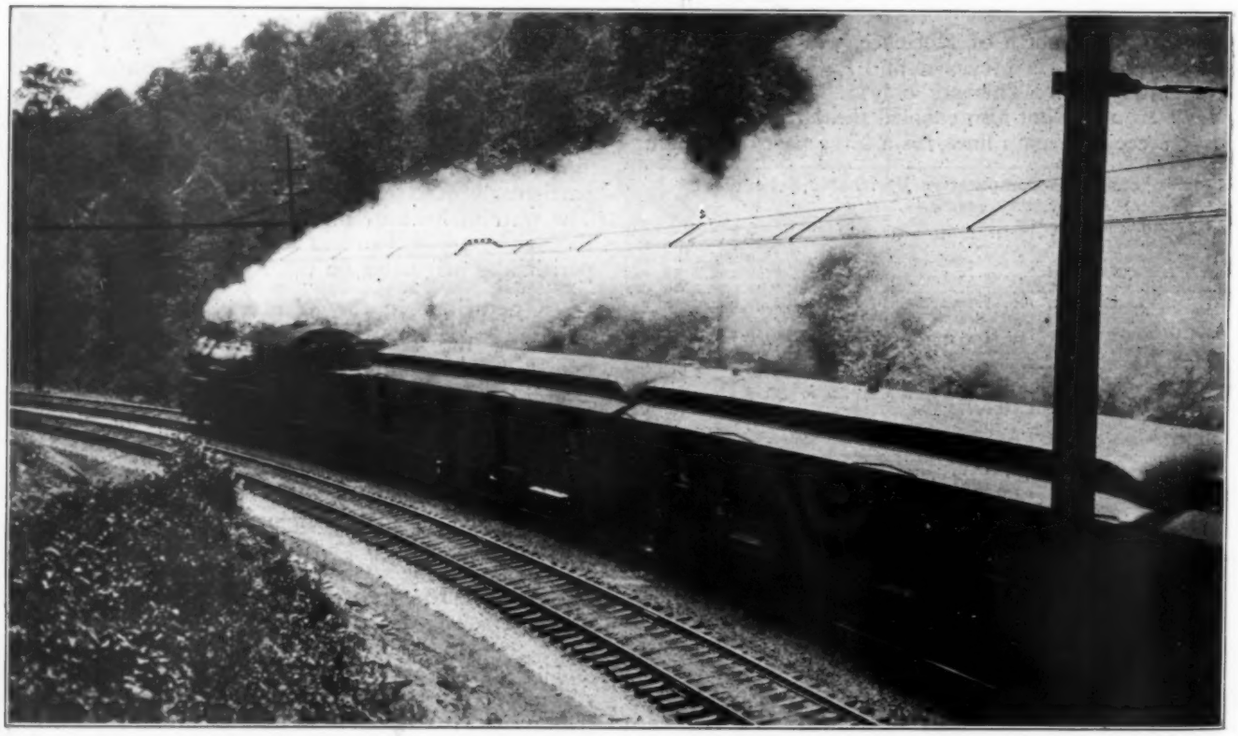
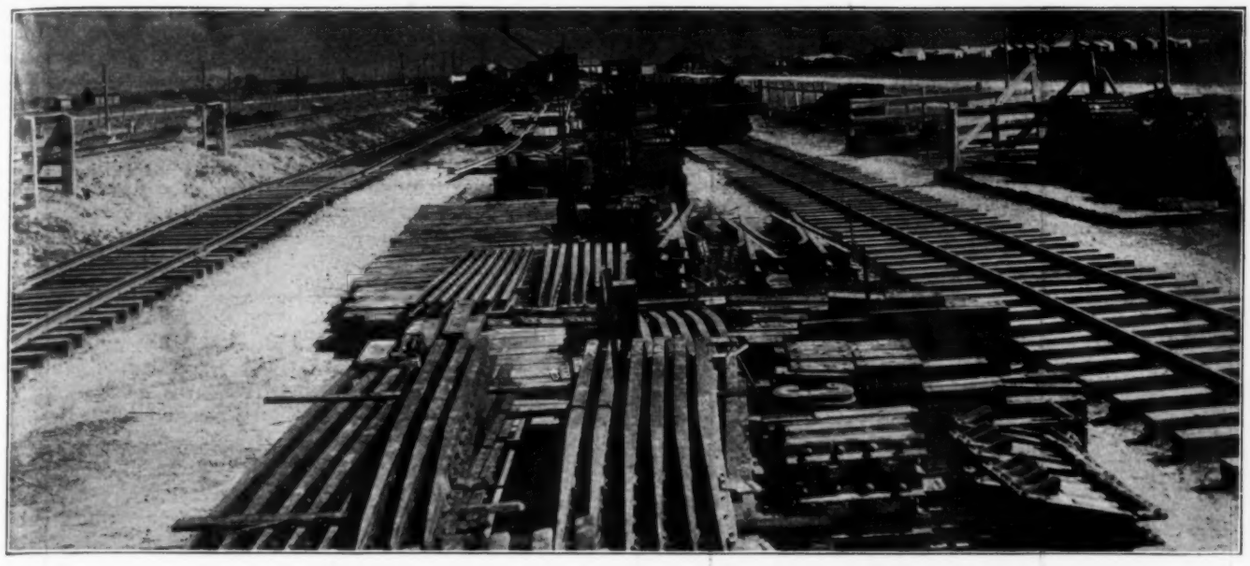


On the Norfolk & Western



Track Material Was Transferred to Narrow Gage Cars at Wendel

Novel Methods Used in Widening Narrow Gage Line

Southern Pacific departs from usual practices in modernizing the Nevada-California-Oregon

ON September 1, 2, and 3, the Southern Pacific staged a colorful celebration at Wendel, Cal., marking the completion of the widening to standard gage of the Nevada-California-Oregon between Wendel and Lakeview, Ore., a distance of 155 miles. With the partial completion of the gage-widening work on this line, on September 29, 1927, between Wendel and Alturas, Cal., 101 miles, the total mileage of narrow gage railroad in the United States was reduced by approximately seven per cent. This has been reduced further by the completion of the work during the present year, which included the remaining 54 miles of the line between Alturas and Lakeview.

The N-C-O, control of which was acquired by the Southern Pacific by the purchase of its capital stock in May, 1926, connects at Wendel with a branch of the S. P. which extends westerly from Fernley, Nev., on the main line between San Francisco, Cal., and Ogden, Utah. In connection with a new line, which the Interstate Commerce Commission has authorized the S. P. to construct from Klamath Falls, Ore., to Alturas, a distance of 98 miles, it will furnish an outlet to the East for the S. P. lines in Oregon which will shorten materially their existing routes.

Apart from its importance as a part of this plan, the N-C-O is capable of developing considerable traffic, since it traverses fertile valleys where the principal industries have been stock raising and dairying, but which are well adapted to the growing of grains, vegetables, sugar beets and fruit, while the territory tributary to Lakeview contains large quantities of merchantable timber. Activity in the production of these commodities has been held back heretofore by the expense and delays incident to the necessary transfer from narrow gage to standard gage cars at Wendel. The new line from Klamath Falls to Alturas will be located via Merrill, Ore., and Cornell, Cal., through fertile agricultural land in the Klamath basin and tapping what is said to be one of the largest stands of virgin pine timber in the United States.

The N-C-O had its beginning in 1880 as the Nevada & Oregon, which was organized to build a narrow gage railroad from Reno, Nev., to Beckwick Pass, Cal. This company became bankrupt two years later, after building 37 miles of line northerly from Reno, and the property was taken over by the bondholders, who extended the road to Amedee, Cal. The present company was organized in 1887, with a charter for a line from Reno to The Dalles, Ore., and the road was extended as finances permitted, reaching Alturas in 1906 and Lakeview in 1912, where further construction was stopped. In 1917, that portion of the line from Reno to Hackstaff, Cal., together with a branch line extending west from Reno Junction, Cal., was sold to the Western Pacific, and in 1922 the company was authorized to abandon the 16 miles between Hackstaff and Wendel.

New Rails Were Laid on Each Side of Old Track

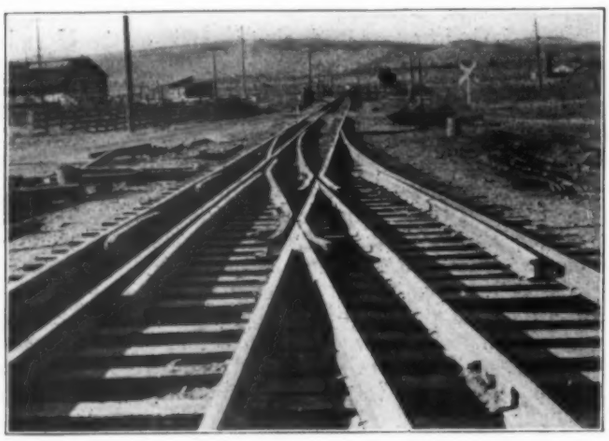
After the Southern Pacific acquired control of the N-C-O, it was necessary to widen the track to standard gage in order to use it as a link in the outlet to the East and also to stimulate local traffic by removing the obstacles imposed by the limitations incident to narrow gage operation. In carrying out the work it was decided to have the center line of the new track coincide with the center line of the old, except at the beginning and end of curves, where standard easements were introduced since the original track has been built and maintained

without these refinements. This decision necessitated laying the new rails on either side of the rails of the existing track and to permit this work to be started without delay, seven standard gage track ties, 7 in. by 9 in. by 8 ft., were inserted at regular intervals in each rail length to replace the same number of narrow gage ties, which were 6 in. by 8 in. by 6 ft. This allowed the new rails to be spiked to gage and to have a bearing on the remaining narrow gage ties, without in any

Turnout to Permit Dual Operation on Four-Rail Track

way interfering with the operation of the narrow gage track, over which the regular service was maintained without interruption until the work of widening the gage was completed.

With the exception of the distribution of the new rail and the new ties necessary to permit it to be laid, which was done by narrow gage cars, standard gage work train equipment was used in order to avoid the transfer of



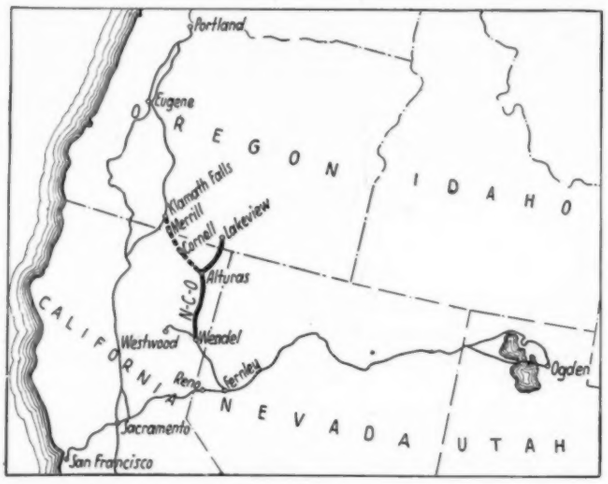
Three-Rail Track Provided for Dual Operation at Alturas

material at Wendel, the work trains being hauled by narrow gage locomotives until the roadbed and structures had been strengthened to permit the use of heavier power. This dual operation required considerable special work at turnouts to accommodate the different gages. At Alturas, where the widening of the gage was suspended for the winter, certain of the yard tracks were provided with a third rail to permit their use for either standard gage or narrow gage equipment, since narrow gage operation was continued between that point and Lakeview until that portion of the line was widened to standard gage.

Track Work

As the new rails were laid, other gangs followed replacing the remainder of the narrow gage ties, widening the banks and ballasting the track. The gravel for this purpose was loaded from pits along the line with a power shovel equipped with a 4½-yd. dipper, the shovel being moved from one pit to another as the work advanced to avoid excessive lengths of haul. Jordan spreaders were used to widen the banks where this was done by material unloaded from trains, and at other places, where side borrow was available, the widening was done by gasoline-operated shovels, one working on each side of the roadbed.

Culverts were extended in advance of the bank widening, and a number of new culverts were installed where the provisions for drainage were inadequate. Other work included the moving of water tanks to the proper clearance for standard gage equipment and raising them so that they could serve the larger loco-



N-C-O Will Form Link in New Outlet for S. P. To East

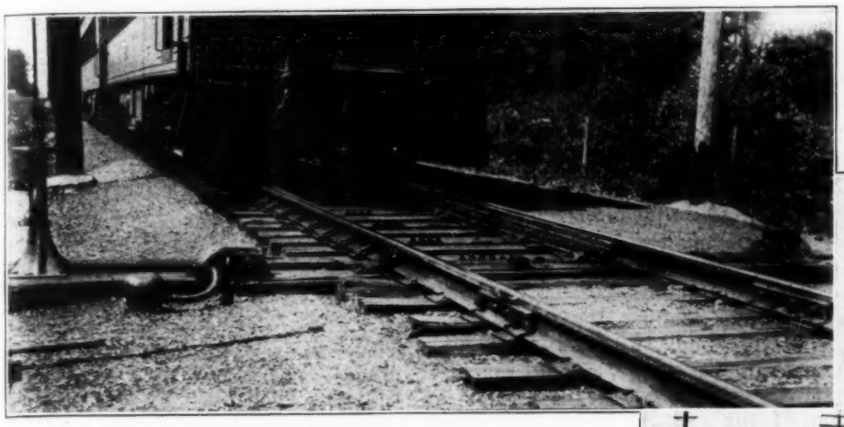
motives, the extension of passing tracks and the widening of narrow cuts.

The widening of the gage, in 1927, between Wendel and Alturas, together with the necessary work incident thereto, was completed in four months with forces averaging 800 men. The laying of the rail was prosecuted at the rate of a little more than two miles a day, the 101 miles being laid in 49 days. In all of the work, motor cars, hauling several trailers each, were used to transport the track gangs between their boarding cars and the work.

The entire project was carried out by company forces under the general direction of George W. Boschke, chief engineer, and under the direct supervision of A. E. McKennett, construction engineer, of the Southern Pacific.

MRS. MARTHA DONK, station agent of the New York Central at Newark, N. Y., since 1877, has been retired on pension, having reached the age of 70, at which age all employees are retired. Mrs. Donk began as telegrapher at the age of 14 and thus has rounded out 56 years of service for the company.

South Shore Line Uses Spring Switches on Heavy Traffic Line



View of Front of Passenger Train Traveling at 45 m.p.h. on Main-Line Trailing Through Spring Switch

Color-Light Signal Protection at a Spring Switch Location—Signal is Located 150 Ft. in Advance of Switch

Number 20 turnouts permit high speeds —Two spring connections used

By B. L. Smith
Signal Supervisor, Chicago, South Shore & South Bend

SEVERAL interesting developments in the application of oil-buffered spring switches have been made recently on the Chicago, South Shore & South Bend, an electrified railroad that is handling a heavy passenger and freight traffic. On the 25-mile section of single track between Gary, Ind., and Michigan City, the "South Shore" is handling 44 passenger and 8 to 10 freight trains daily, and in the summer season as high as 62 passenger trains on Sunday.

Passenger trains consist of from 2 to 8 cars, and freight trains, up to 40 cars. The motor cars weigh 130,000 lb. and the trailers 93,000 lb. The dining cars weigh 112,000 lb. and the parlor cars 111,000 lb. Freight locomotives, of which there are eight, weigh 80 tons each. About 140 coaches pass through the high-speed sidings in a day, or an average of three cars per train. The "South Shore" carries fast l.c.l. freight with overnight service between points on its own lines, and interchanges at several points with steam roads. About 150 cars of freight are handled daily and in the coal season as high as 400 cars.

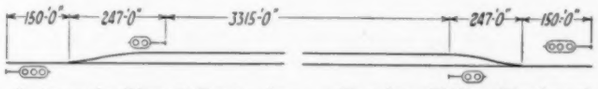
Fast Schedules Maintained

Through passenger trains are scheduled to run between Gary and Michigan City in 31 min. or at the rate of 49 m.p.h. In order to maintain such schedules, the number of train stops and the time lost in waiting at meeting points, must be reduced to a minimum. The schedules are so arranged that opposing trains arrive at opposite ends of a passing track at approximately the same time.

A typical passing track, 4,060 ft. long, is located on the north side of the main line at Tamarack, 15 miles east of Gary. The switch at the east end is set normally to divert trains on to the passing track, and after running the length of this track, they trail out through the switch at the other end, which is set normally for the main line. Eastbound trains stay on the main line, trailing through the switch at the east end of the passing track. In order to permit trains to run in and out of these passing tracks at high speeds, No. 20 turnouts have been installed. Trains operate through these turnouts normally at 45 m.p.h., but a test demonstrated that the speed could be increased to 60 m.p.h. with safety.

Special Features of Switch Construction

The main line as well as the passing tracks are laid with 100-lb. rail. Morden adjustable rail braces are used on the front switch tie with an insulated gage plate, while 14 Morden 5/8-in. detector bar braces are installed on each point. Tie plates and rail braces are used on the 15 or 16 ties back to the end of the switch points, which are 30 ft. long and are reinforced with steel



Automatic Signal Protection at Passing Siding Equipped with Spring Switches

straps 1¾ in. square by 28 ft. long, to prevent the whipping of the points when the switch is being trailed through.

Four adjustable gage rods are used, with a Morden spring rod connection on the first rod, connected to the

operating rod of the switch stand, and another spring rod on the gage rod connected to the fixed plate. This second spring is used for the purpose of holding the switch stiff and tight against the rail, and to prevent bending of the point. Two 7 in. by 9 in. switch ties 18 ft. long support the switch stand on one side of the track and the oil buffer on the other. The buffer is mounted on ½-in. by 6-in. by 3-ft. sheets of boiler plate secured to the ties with five 5-in. lag screws. The buffer is placed on the boiler plate, and held by four ¾-in. by 9-in. bolts, extending through the plate and tie. Pale semaphore oil is used in the buffers, which are so adjusted that an interval of about 19 sec. is required for the switch to close after a train passes.

Automatic Signals Afford Protection

Automatic block signals are provided for the entire line, with special signaling to protect movements over the spring switches. A special facing-point protecting signal is located 150 ft. in advance of the switch point. A switch circuit controller, connected to the normally-closed point, will cause the signal to indicate "red" if the point is open ⅛-in. or more. A motorman receiving a red indication at one of these signals is required to stop and investigate the condition of the switch. This signal also operates as one of the automatic block signals, the track circuit control extending by way of the passing track. In some cases, following trains running close together are required to close up and enter the same passing track to meet an opposing train. With the leading train in the passing track, the second train receives a signal of "red" over "yellow," giving the motorman assurance that the switch point is in the correct position and also giving him authority to enter the passing track prepared to stop short of the train ahead of him. A green signal indicates that the switch is closed and the track clear.

The regular head-block signal, to hold trains at a station when a train is approaching from the next siding, is located back of the switch at a point opposite the clearance point of the siding. This signal, in addition to the regular control, is controlled through the switch circuit controller so that if the switch is not in the correct operating condition or is blocked, the signal will indicate "stop."

Results Obtained

Following the installation of four of these typical passing tracks with spring switches, the South Shore made extensive tests, with results so satisfactory that two other layouts are planned for early installation.

Under the present schedule, with an hourly passenger service between South Bend and Chicago, regular trains meet at Wilson, Shops and Warren. In addition to this service, it was found that on Saturdays, Sundays and holidays, half-hour service was necessary between Michigan City and Chicago during certain periods of the day. This service was placed in effect as needed and considerable difficulty was encountered in getting these half-hour trains through on time, without delay to the trains on regular hourly schedules. One meeting point at Keiser Siding, approximately eight miles west of Michigan City, did not prove to be satisfactory. The removal of this siding approximately one mile eastward, with spring switches at both ends, has corrected this trouble, and the fact that no trains are now required to stop and throw switches has made it possible for half-hour service to be operated successfully with practically no delay.

Freight service, as well, has been benefited by this high-speed siding. With passenger trains operating on an hourly service, it has always been necessary for a freight train leaving Michigan City shops to follow a westbound passenger train, scheduled to leave 44 min. after the hour. Heretofore, freight trains leaving the shops immediately following a passenger train, have been able to go to Power Siding, a distance of five miles through city streets, with several safety stops, at which point they were required to clear the next eastbound train (due at 28 min. after the hour).

After having cleared this train at Power Siding, if on time, the freight train would then, under favorable conditions, proceed to Wilson, which is a high-speed passing track similar to the new Keiser Siding, but longer, at which point it would clear the following eastbound as well as the westbound trains, the eastbound train being due at the west end of the siding at 9 min. after the hour, and the westbound train at 14 min. after the hour. Clearing of two trains at Wilson invariably meant that the freight train would delay either one of the trains for a short period of time while backing over.

With the new siding, it is now possible for a freight train to leave the shops at Michigan City and proceed to the new Keiser Siding, clear the eastbound passenger train at 24 min. after the hour and go to Wagner, which is the first siding beyond Wilson. In some cases, under the most favorable conditions, or by train order, a freight train can clear an eastbound passenger train at Keiser, and then go to Gary for the second eastbound train which is due to leave that point at 58 min. after the hour. Freight trains which previously consumed from three to four hours between Michigan City and Gary, now make the trip in from one hour and 15 min. to two hours.

TWENTY-FIVE GUARDS KILLED is the report of a train robbery and wreck in Mexico on the night of August 30, as told in a report from a point in the state of Morelos, 90 miles from Mexico City. The massacre was by a band of outlaws who robbed the passengers and then destroyed the train by fire.

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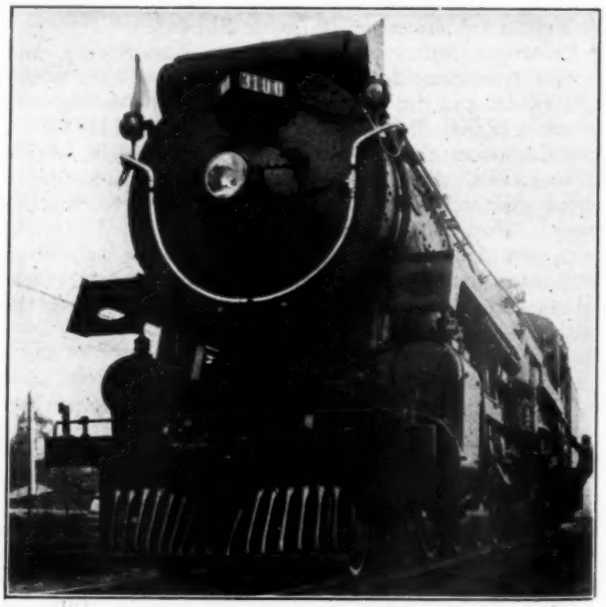
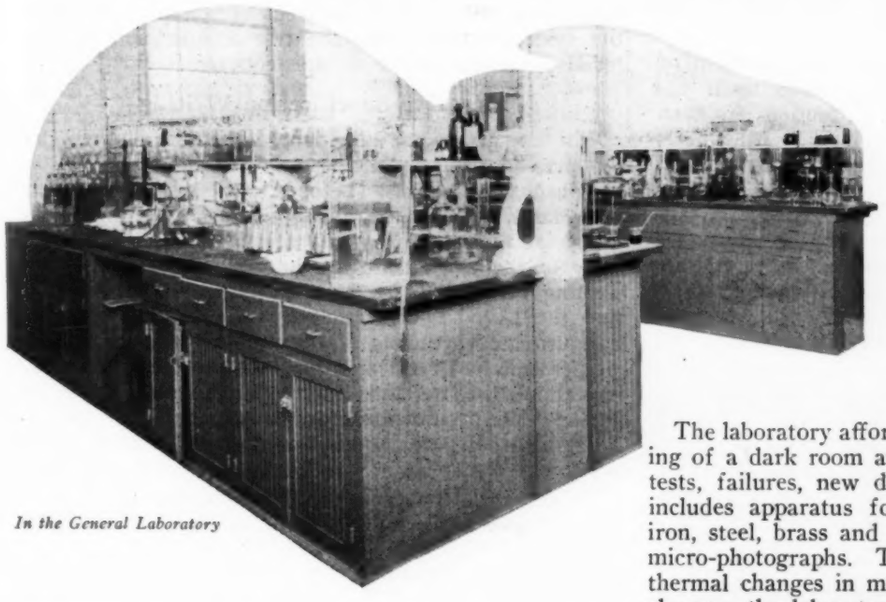


The Largest Passenger Locomotive in the British Empire, a C. P. R. 4-8-4 Built at Angus Shops

M-K-T. Expands Test Work

Control by supply forces a feature—Show ratings of firms—Report costs.



In the General Laboratory

THE Missouri-Kansas Texas has a test and inspection department whose development, organization and work are of interest from several angles. It is controlled by the supply organization, prepares summaries of rejected material and compiles inspection costs and savings.

Although established only 10 years ago, the department has expanded rapidly. It comprises not only chemical and physical laboratories, but also a field inspection division. The department is quartered at Parsons, Kan., in a building vacated by mechanical forces when new shops were built there. The building is spacious, and with minor alterations and painting, has given the department excellent accommodations.

Chemical Laboratory

A chemical laboratory of three rooms has been provided, one for general work, a second for paint and oil analyses and a third for weighing operations and also for keeping laboratory supplies. The facilities include chemical cabinets, acid-proof sinks and piping, fume-proof hoods and sample cases, and the equipment includes viscosimeters, flash and fire testers, gravity indicators, colorimeters and chronometers and carbon residue and cold test apparatus for oil analyses, and a variety of high-grade balances for delicate weighing. In the paint laboratory are a high-speed centrifuge for separating paint from its vehicle and a refractometer for detecting adulterations in paint oils, while the chemical laboratory also includes an electrometric titrater for determining the manganese, chromium and vanadium in steel, electrolytic apparatus for determining copper, lead, etc. in brass, bronze and steel, a bomb calorimeter, carbon train apparatus and color comparators for carbon analyses, and also gas analysis equipment, fusion and melting point furnaces and electric ovens.

The physical laboratory and mechanical test section equipment includes a 10,000-lb. testing machine for testing brass, aluminum, belting and other materials of low tensile strength. There are also instruments for testing the hardness of all classes of material, from soft thin sheets to hard heavy bars, including tools; a Navy standard pendulum-type machine for testing hose and similar rubber products, while machines have been improvised for testing shovels, abrasive wheels, files, saw blades, air motors, etc.

The laboratory affords a photography section, consisting of a dark room and accessories for photographing tests, failures, new devices and general views. This includes apparatus for microscopic examinations of iron, steel, brass and similar material and for making micro-photographs. To assist the microscopic study of thermal changes in metals and the resultant structural changes, the laboratory also has an electric heat-treating furnace.

Efficiency Testing Apparatus

Other equipment of the physical and chemical laboratory consists of instruments for making electrical tests and also complete cement and concrete testing apparatus. There is also considerable apparatus for making efficiency determinations on locomotives and locomotive devices such as injectors, feed-water heaters, boosters, stokers, oil-burners, lubricants and headlight equipment.

The scope of work has been enlarged to promote safety in transportation through the detection and elimination of defective material, to assist in appraising the merits of the claims made by firms for their supplies as well as insuring uniformity in the materials purchased, to assist the claim department in acting on claims made for loss and damage to freight including perishables, to reduce delays in receiving material by expediting its inspection, and to co-operate with various departments in conducting different tests and developing general scientific information.

Shipping Point Inspection

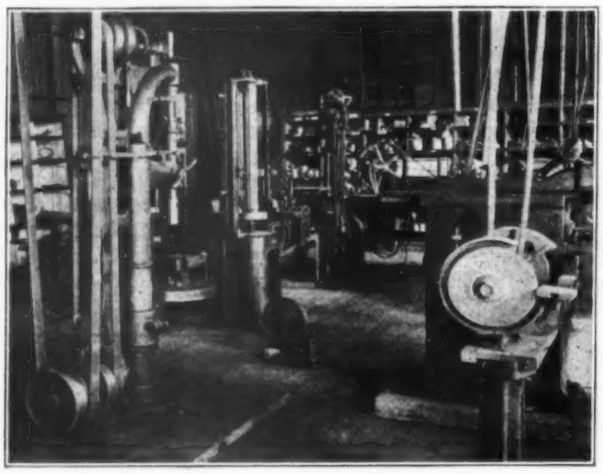
An increasing amount of material is being purchased subject either to inspection at destination or inspection at the point of shipment. Samples of material subject to inspection at destination are recevied at the laboratory and analyzed and tested before the material is accepted and placed in stock, but the department's work also extends to shipping-point inspection. Where purchase orders provide that material must be inspected at the point of manufacture by a representative of the road it is understood that the material shall not be shipped until it has been accepted as satisfactory and stamped by the inspector to that effect.

A corps of inspectors has been organized which is large enough to conduct all field inspection of material bought, with the exception of rails which are inspected by commercial laboratories. The inspections cover observations of the processes and conditions under which the manufacturing is done and also general investigations of manufacturing plants. Samples of materials

being manufactured are forwarded to the laboratories for analysis.

Special Attention Given Wheel, Axle and Brake Inspection

Because of the direct bearing that the condition of wheels, axles and brake equipment have upon the safety of transportation, particular attention has been given to this branch of inspection work. All wheels of both cast iron and steel are carefully inspected at the manufacturing plant by men experienced not only in examining surface defects but in pouring, and annealing operations. Both drop tests and heat tests are made. The inspection is supplemented with accurate mounting and removal records which are kept up-to-date with the individual test record of each wheel, so that information concerning the location of each wheel



Testing Equipment in Physical Laboratory

in service or the reason for its removal is available at all times. Axles, castings and other equipment are examined for blowholes, segregations, cracks, heat strains and other imperfections and the dimensions of all such products are checked against standard blueprints.

Test Reclaimed Materials

Included among the plants subject to these inspections is the company's own reclamation plant. This plant is situated at Parsons, and conducts unusually extensive reclamation operations, comprising not only the repairing of material discarded as scrap, but the conversion of much scrap material into other products, among which are coupler yokes, grab irons, track tools, etc. While these operations are conducted by the same department that has jurisdiction over the test department, the production of the reclamation plant receives the same attention from the test organization as material purchased from outside concerns.

Increased Specification Writing

The expansion of the laboratories has led to the preparation of many specifications for use in conducting the purchasing work. The specifications are developed from knowledge gained during the various testing operations of the laboratory and are compiled also with a view to the work done by the American Society for Testing Materials, the American Railway Association and the U. S. Specification Board. Both the supply and using departments of the road co-operate in their preparation and must approve each specification before it is adopted. The latest approved list contains approximately 39 specifications for maintenance of way materials and 55 specifications for equipment materials, as follows:

Maintenance of Way Materials

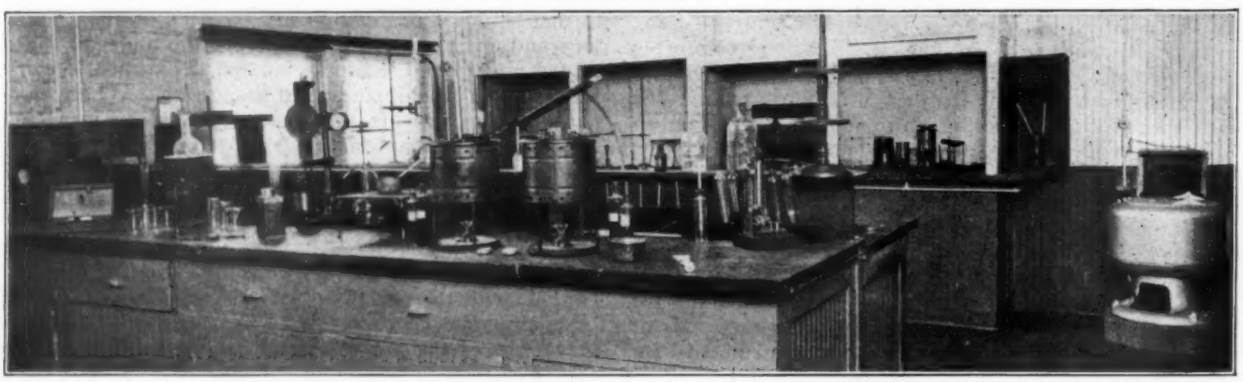
Alumina, sulphate of, for water softening
Bars, reinforcing
Bars, splice, high carbon steel
Bolts, track, carbon steel
Bridges, steel
Concrete
Creosote, for timber treatment
Fencing, woven wire
Gasoline, motor
Lime, for water softening
Locks, section and station
Lumber, for bridges and buildings
Oil, semaphore
Oil, signal
Piling, timber
Plates, tie
Posts, stock pen
Preservative treatment, specifications for ties, timber and piling
Rails, guard and crossing
Rails, open-hearth
Rules and instructions for engineers
Soda ash, for water softening
Spikes, steel track
Steel, structural shapes
Tanks, wooden water
Ties, cross and switch
Timber, bridge
Tools, track
Turntables, installation and care

Maintenance of Equipment Materials

Alloys, white bearing metal for locos
Axles, carbon steel, for cars and tenders
Bars, wrought iron
Belting, leather
Billets, carbon steel
Billets, carbon vanadium steel
Brooms
Castings, malleable iron
Castings, steel
Castings, vanadium steel
Chains, crane
Coke, foundry
Cross arms, pine
Cylinders, cast iron locomotive
Drier, Japan
Forgings, annealed carbon steel
Forgings, carbon vanadium steel
Forgings, for draw bars
Gage glasses
Gaskets, air hose
Handles, hickory
Hose, air brake and signal
Hose, tank
Iron, foundry staybolt
Iron, solid staybolt
Japan, coach
Lead, pig
Oil, boiled linseed
Oil, illuminating
Oil, mineral seal
Oil, raw linseed
Pins, heat treated for MCB couplers
Rivets, steel
Sheets, galvanized
Sheets for loco. jackets
Solder metal
Steel, boiler and firebox
Steel, engine bolt
Tape, friction
Tape, rubber insulating
Tires, steel
Tubes, seamless steel boiler
Turpentine
Waste, colored cotton wiping
Waste, wool and cotton for packing
Wheels, cast iron

Report Bad Material

In addition to preparing specifications, the department keeps an itemized record of every test or in-



Apparatus for Examining Oils

spection, showing the quantity of material accepted or rejected and the cost of the work. The salary and traveling expenses of the inspectors and chemists chargeable to each inspection and the cost of any material required in such tests are taken as the cost of the work. This is compared with commercial prices obtained from price lists issued by such laboratories, from special bids secured or other information. When the commercial price is obtained, it is reduced to a common denominator with the laboratory's costs and the difference between the road's total cost for each job and the total cost of commercial testing, determined by this plan, is taken as a saving or loss of the department's work.

Annual Statement Prepared

An annual statement is prepared which gives both the results of the tests and the comparative costs. The statement lists in alphabetical order, the articles inspected and the firms supplying each article. Opposite each firm are the amount of the material inspected and rejected, the per cent of the material accepted and rejected; also the average unit cost of inspecting the material from each firm; the average unit cost of comparable commercial inspection, the total cost of the department's inspection, the estimated total cost of the commercial inspection and the difference expressed as a saving or loss.

The statement also summarizes this information for each class of material and for the entire inspection work of the year. The tabulation gives a portion of the statement for 1927, showing material which did not all pass inspection.

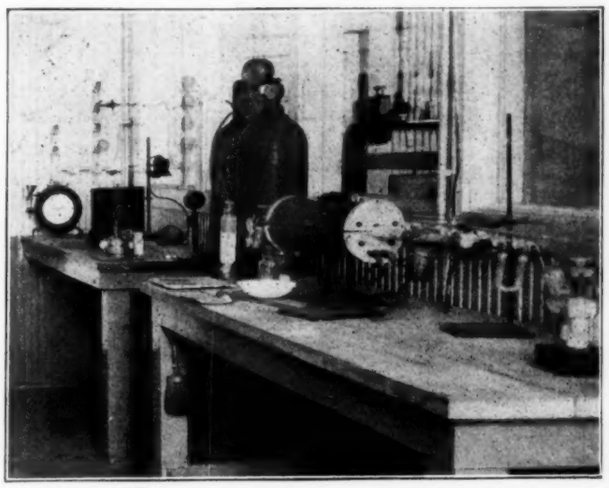
Statement of Inspection Work—Year 1928

Material	Firms	Unit	Amount Inspected	Per Cent Rejected
Axles, car	1	Ea.	2298	5.5
Bearings, jour.	2	Ea.	74093	.6
Billets, iron	3	Ton	57.05	3.2
Bolsters, body	3	Ton	158.24	1.5
Bolsters, truck	2	Ea.	1599	3.1
Brake, shoes	2	Ton	492.48	1.9
Castings, brass	1	Ton	5.94	2.7
Castings, S & M.	14	Ton	3806.24	3.3
Chain	4	Cwt.	1033.21	7.2
Cylinders, loco.	2	Pr.	9.5	5.3
Forgings	19	Ton	633.55	4.3
Frog & sw. mtl.	3	Ton	689.26	.9
Glasses, gage	2	Doz.	165	.4
Globes, lantern	2	Doz.	144	.6
Iron, bar	3	Ton	1167.36	1.6
Iron, E.B.	2	Ton	203.60	.8
Iron, galv. sheet	1	Ton	58.48	6.4
Iron, S.B.	2	Ton	122.50	3.1
Lead, pig	2	Ton	.52	48.1
Leather belting	2	100 ft.	26.11	3.1
Nuts, hex.	1	Ton	7.80	87.2
Rivets, steel	6	Ton	274.42	.1
Steel, B&F	2	Ton	279.83	2.0
Steel, structural	10	Ton	5074.50	3.2
Tie plates	1	Ton	9915.00	.8
Founts, lamp	1	Ea.	311	5.8
Oilers, hand	1	Ea.	248	6.0
Reflectors	1	Ea.	20	100.0
Shields, gage lamp	1	Ea.	25	100.0
Shields, water glass	2	Ea.	321	46.7
Tubes, boiler	4	Ton	685.50	8.4
Wheels, C.I.	4	Ea.	21214	5.5
Wheels, R.S.	4	Ea.	1493	.1
Wire, fence	2	Ton	80.01	5.0
Wire, H.D copper	1	Ton	11.44	11.4

There were rejections in connection with 33 of 85 kinds of material inspected during the year. The rejections were usually small, amounting to less than 1 per cent but frequently reaching 5 and 6 per cent, occasionally reaching 20 per cent and in a few instances exceeding 50 per cent. An order of iron pipe was entirely rejected. In the many instances, where the same class of material was secured from several different firms, the statement shows much variation in the results of inspection. In connection with the purchase of steel and malleable castings the material from only 3 out of 15 firms involved in furnishing it did not suffer rejections:

Firms	Amount Inspected, Net Tons	Per Cent Rejected
A	1,456	3.7
B	13	0.0
C	559	0.3
D	17	0.0
E	289	1.9
F	9	0.3
G	302	3.1
H	794	6.3
I	10	3.5
J	56	0.8
K	16	18.0
L	40	0.0
M	124	0.5
N	115	0.1

The detailed statement also brings out that where one firm supplies material of different kinds, the inspection results frequently vary as between the different



Apparatus for Testing Fuels

materials furnished. In the case of one well-known manufacturer, the tonnage of one class of material obtained from it passed the inspection successfully but there were rejections to the extent of 0.5 per cent, 1.6 per cent and 2.9 per cent in connection with three other kinds of material secured from the same source.

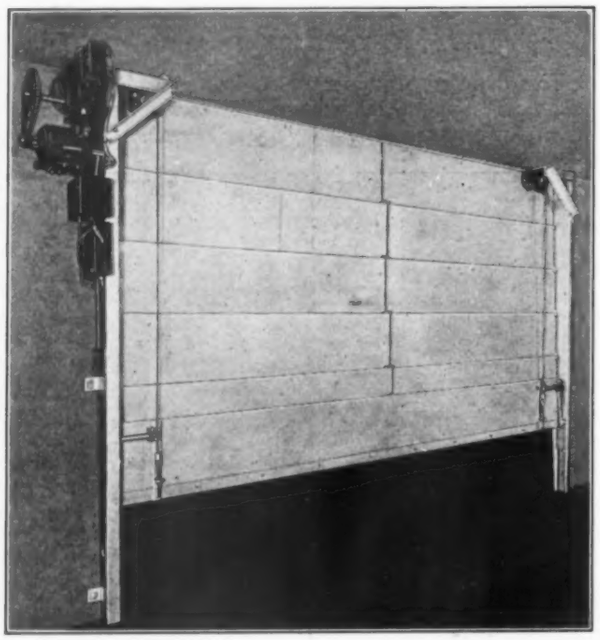
A copy of this statement is said to be of much assistance to the purchasing agent by affording a check on the responsibility of firms in fulfilling specifications. The cost statements show much variation between the unit costs of inspecting in different years, also between the current cost of inspecting material from different firms, but they are effective in keeping the department alert to the expense of its work and affording the road evidence of its economy.

The department is operated by N. J. Boughton, engineer of tests, as a branch of the purchasing and stores department.

THE CHICAGO, BURLINGTON & QUINCY STORES DEPARTMENT and shops improved their safety performance in June, 1928, as compared with the same month last year. The 13 shops on the lines east had the same percentage as the year before, 0.34, while the 12 shops on the lines west reduced theirs from 0.19 to 0.13. The last-named percentage is equivalent to one reportable injury for each 790 men employed. Nine of the twelve shops carried 3,346 men through the month without any casualties. The 15 stores on the system averaged one man injured for each 411 workers in June, 1928, compared with one in 213 a year ago.

Burvett Door Improved

THE Burvett vertical lift door, which is designed to afford a sturdy, burglar proof, fireproof and weather proof barrier for either small or large openings, has been improved in a number of respects recently. This door, which is now being manufactured by J. S. Thorn Co., Philadelphia, Pa., is adapted particularly to railway freight and warehouses. It is built



Rear of the Burvett Door Showing Type of Construction, Locks and Power Operating Equipment

of a series of 16-gage steel plate interlocking panels, which lift vertically within heavy channel jamb guides, telescoping into a compact group to a depth of a single panel, which requires headroom of only about 22 in. when the door is completely raised.

Operation of Door

The door, which utilizes no wall space, is simple of operation, being raised by means of either a hand chain or an electric motor. In either case the power applied turns a grooved spiral drum which receives two lines of heavy steel cable attached to the bottom plate panel. When operated by hand, or by a one-way motor, it is lowered by pulling lightly a hand chain attached to a brake lever, which disengages the clutch and permits the door to lower by gravity under the check of counterweights.

As each section lowers, lugs attached to the extreme ends of the panels are forced into pockets formed in the heavy channel jamb guides, by means of heavy flat springs attached to the bottom panel. This arrangement holds each panel firmly in place and in addition allows only slight deflection under heavy wind pressure.

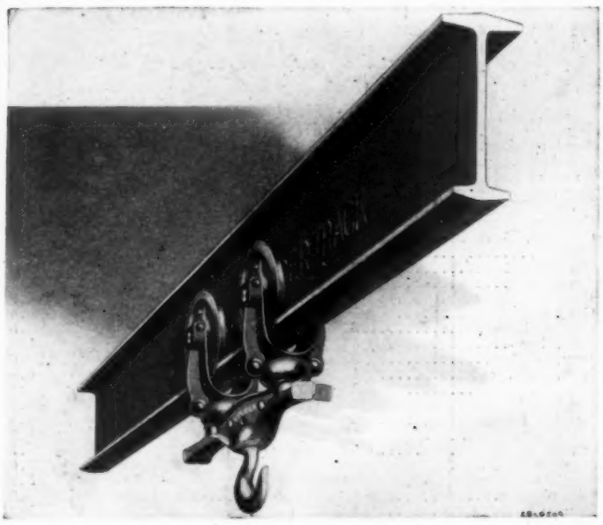
As the door is lowered, the various panels are guided into interlocking positions by means of ¼-in. steel rods at the center of the door, which are attached to all except the bottom panel. As the door seats itself in a closed position, it is locked automatically by means of two locks, one on either side. These locks consist of heavy steel plungers which engage in holes provided in the lower ends of the jamb channels. Special features claimed for the door are low maintenance cost, and the fact that it can be readily repaired in case of damage. Any damaged panel can be removed, repaired and rehung; the actual time of removing and rehanging averaging about 30 minutes. The Burvett door can be furnished with glass panels if desired, and also can be equipped with a fusible link for points where the door is to act as a fire door.

A New Monorail Track

THE Louden Machinery Company, Fairfield, Iowa, manufacturer of industrial monorails, has recently brought out a heavier line known as Louden super-track which is designed for a carrying capacity of 3,000 lb. This new overhead trolley track is a special I-beam section, approximately six inches deep with a three-inch flange at the top and a two-inch flange at the bottom. Special two-way, three-way, cross-track and turntable switches have been designed for use with the new track.

One advantage of the new design is that it eliminates, in large measure, the necessity of a supporting superstructure. Hangars, alsq, may be spaced further apart, saving time and minimizing expense of erection.

The super-track is not intended to supersede the monorail system with double-bead track manufactured



The Louden Super-Track

by the Louden Machinery Company, but is an addition to its line of conveying equipment, intended particularly for use with its chain drive trolley conveyor systems. It may be used alone or in conjunction with the lighter monorail.

THE LENGTH OF A METER, as now defined by the deputy warden of British Standards, is 39.370,147 inches. The British authorities have published a new "determination" of the ratio which heretofore for many years has been one meter to 39.-370,113 inches. This announcement, with other information about the fortunes of the metric system in America, is given out by the American Institute of Weights and Measures, 115 Broadway, New York City.

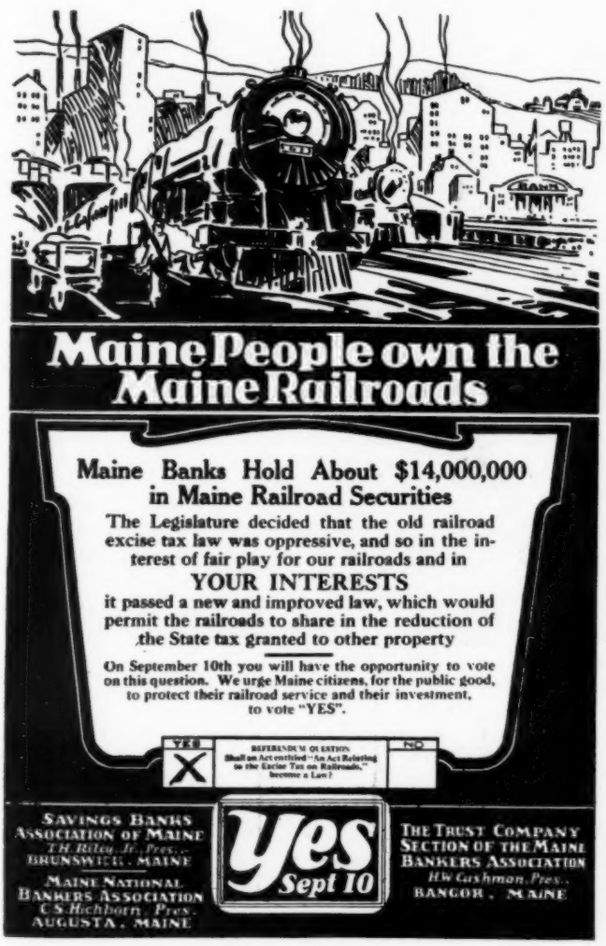
Maine Roads Fight for Fairer Tax

Reform measure, passed over veto, is put to referendum —Roads carry campaign to voters

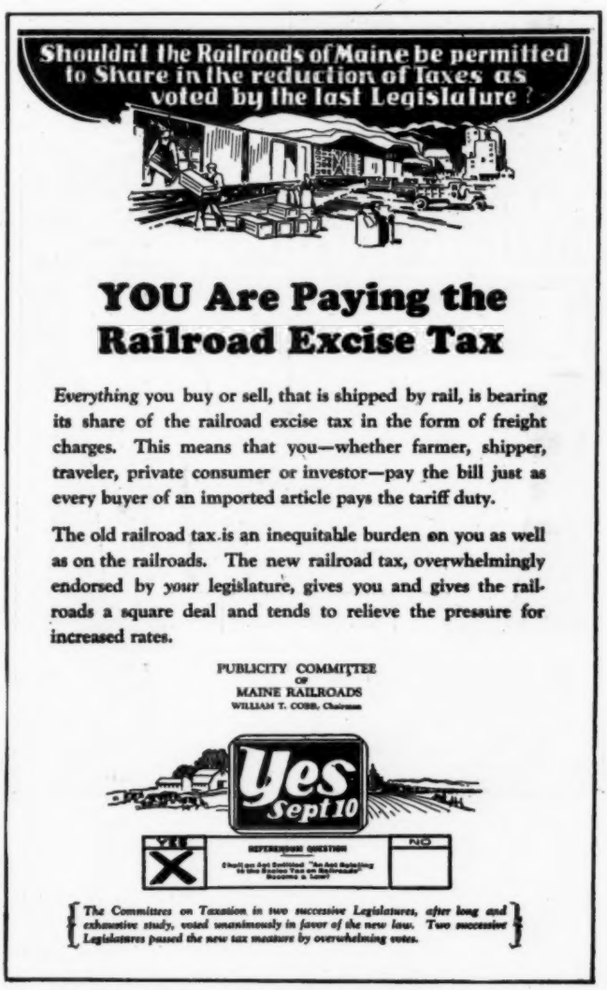
RAILROADS of Maine have been forced to carry directly to the people a battle for a just assessment of the railroad excise tax levy, which was granted to them by the last legislature and has become subject to a popular vote at the state election of September 10, by reason of a referendum.

The problem of how to place so complicated a matter as tax reform before the voters in a way that they would understand was not a simple one. It has, however, been done by the railroads by the simple expedient of laying all their cards face upward on the table, with results that will not be definitely known until election day, but which, at the present writing, assume a favorable aspect.

The fourteen railroads which serve the state and are affected by the tax have worked through a publicity committee headed by William T. Cobb, former governor of Maine, and a director of the Maine Central Railroad, which committee consists of representatives of the legal and publicity departments of the railroads involved.


Maine People own the Maine Railroads
Maine Banks Hold About $14,000,000 in Maine Railroad Securities
The Legislature decided that the old railroad excise tax law was oppressive, and so in the interest of fair play for our railroads and in
YOUR INTERESTS
it passed a new and improved law, which would permit the railroads to share in the reduction of the State tax granted to other property
On September 10th you will have the opportunity to vote on this question. We urge Maine citizens, for the public good, to protect their railroad service and their investment, to vote "YES".
YES
X
REFERENDUM QUESTION
NO
Savings Banks Association of Maine
Maine National Bankers Association
C.S. Hichborn, Pres.
AUGUSTA, MAINE
Yes Sept 10
The Trust Company Section of the Maine Bankers Association
H.W. Gushman, Pres.
BANGOR, MAINE

A 12-in. by 18-in. Poster Printed in Color and Widely Displayed


Shouldn't the Railroads of Maine be permitted to Share in the reduction of Taxes as voted by the last Legislature?
YOU Are Paying the Railroad Excise Tax
Everything you buy or sell, that is shipped by rail, is bearing its share of the railroad excise tax in the form of freight charges. This means that you—whether farmer, shipper, traveler, private consumer or investor—pay the bill just as every buyer of an imported article pays the tariff duty.
The old railroad tax is an inequitable burden on you as well as on the railroads. The new railroad tax, overwhelmingly endorsed by your legislature, gives you and gives the railroads a square deal and tends to relieve the pressure for increased rates.
PUBLICITY COMMITTEE OF MAINE RAILROADS
WILLIAM T. COBB, Chairman
Yes Sept 10
YES
X
REFERENDUM QUESTION
NO
The Committees on Taxation in two successive Legislatures, after long and exhaustive study, voted unanimously in favor of the new law. Two successive Legislatures passed the new tax measure by overwhelming votes.

An Advertisement Inserted in Maine Newspapers

A strong point that has been emphasized in the publicity campaign, which really has been a campaign of education, is that the legislature had granted a general reduction in property taxes, not applicable to the railroads, and intended that the roads should otherwise have a share in tax reduction by the adoption of the new excise tax law.

The advertising has been done by newspaper display and by means of attractive posters appealing for a square deal for the steam railroads and setting forth the facts of the new and the old excise tax law. It has stressed the fact that the old law is unjust and onerous because of the method of assessment and the heavy burdens it places upon the roads, especially upon the smaller and weaker ones.

These posters and advertisements have pointed out that the new law is in closer harmony with present-day

conditions. A pamphlet also has been given wide distribution, going thoroughly into the history and provisions of the old law, and showing by clear-cut comparisons that

Maine's Prosperity Depends on Efficient Transportation
The Legislature decided that the old railroad excise tax law was oppressive, and so to help the railroads give
MAINE INDUSTRIES
modern transportation service at a reasonable cost, the Legislature passed a new and improved law which would permit the railroads to share in the reduction of the state tax granted to other property.
On September 10th you will have the opportunity to vote on this question. Maine's industrial and commercial interests urge Maine citizens, for the public good and for efficient transportation, to vote "YES"
YES
X
REFERENDUM QUESTION
NO
Yes Sept 10
ASSOCIATED INDUSTRIES OF MAINE
Elliot Rogers, President
KENNEBUNK - MAINE
Benjamin F. Cleaves, Secretary
PORTLAND - MAINE

An Appeal to Shippers

the present excise tax in Maine is the highest tax of its kind in the country, except that in California.

In furtherance of the cause of public information on the subject, a booklet has been sent throughout the state, giving in simple question and answer form information to aid the voter in reaching a fair decision. All this advertising matter stresses a "Yes" vote to complete the action of the legislature and to aid the railroads in giving better service, which means helping the farmers, industries and the public generally.

The principal railroads of Maine are now required to pay an excise tax of 5½ per cent of gross transportation receipts, in addition to local taxes to Maine cities and towns and federal income taxes. By way of illustration of the burden of the present tax it was shown that in the seven years since the Maine Central Railroad was returned to its owners, after government operation, it paid the state over $6,500,000 in excise taxes, while its dividends for the same period amounted to only $1,680,000.

The new excise tax law is known as the "gross-net" plan and has received the approval of leading tax experts in the country. When the net operating income of a railroad does not exceed 10 per cent of gross receipts, the proposed law provides for a 3½ per cent tax. When the net operating income exceeds 10 per cent, but does not exceed 15 per cent of gross receipts, the tax is 4 per cent. When it exceeds 15 per cent but not 20 per cent of gross receipts, it is 4½ per cent and this is raised to 5 per cent on net exceeding 20 per cent but not 25 per cent of gross, and to 5½ per cent on net exceeding 25 per cent of gross.

The bill came before the legislatures of 1921 and 1923 and died in committee. Meantime public sentiment was developing in its favor and in 1925 it was passed and vetoed by Governor Brewster. In 1927 it was again passed. The same governor vetoed it again, but this time public opinion, expressing itself emphatically through its chosen representatives, passed the law over the veto, in the Senate by a vote of 23 to 6 and in the House by a vote of 100 to 39. Governor Brewster carried his antagonism to the law to the point where he succeeded in

A SQUARE DEAL for our Railroads
The last legislature passed a new law which would permit the railroads to share in the reduced state tax.
A vote to support the Legislature will help railroads render to
MAINE FARMERS
the kind of transportation service essential to their prosperity.
On September 10th you will have the opportunity to vote on this question. A "YES" vote will support the Legislature, give the railroads a square deal and promote good service.
YES
X
REFERENDUM QUESTION
NO
Yes Sept 10
PUBLICITY COMMITTEE OF MAINE RAILROADS
William T. Cobb, Chairman

A Poster Addressed to the Farmers

obtaining a referendum upon it and that is how it comes to be on the ballot at a time when national and state issues are engaging the attention of the voters.

Leaders in industry have come forward to commend the new law. It has the approval and active support of three of the four living ex-Governors of Maine, farm leaders and men in public life. A gratifying feature of the campaign is the practically unanimous backing of the press of the state. No newspaper has come out in opposition and only one or two have refrained from favorable comment.

Business Car Built by the American Car & Foundry Company for the Gulf, Mobile & Northern

Business Car for the Gulf, Mobile & Northern

Striking example of the possibilities that can be obtained in interior decoration and lighting

THE American Car & Foundry Company delivered a business car in the spring of this year to the Gulf, Mobile & Northern for the use of its president, I. B. Tigrett, in the interior design of which a number of innovations have been incorporated. Special attention has been given to the lighting, wall and ceiling finish, fixtures and furnishings. The lighting equipment and fixtures were supplied by the Safety Car Heating & Lighting Company. Electric current is obtained from a 4-kw., 40-volt, 75-amp. slow-speed underframe suspension system, driven from the axle. An auxiliary car equipped with a 3-kw. motor generator set having a 110-volt, 60-cycle motor, is frequently used with this car, and in addition it is also equipped with a transformer operating on 110-volt, 60-cycle current, which is connected to the lighting circuits only. A separate regulator is used for the motor generator set. Receptacles are also provided for city current connections.

Lighting Fixtures

The design of lighting fixtures used throughout the car is shown in the two interior views of the observation room. The two ceiling fixtures are combination fan and light fixtures, with four candle brackets. Double bracket lights are located between the windows. These lights, as well as the table lamp, are provided with shades to match the general interior scheme of decoration. The passageways, staterooms, toilets and kitchen are provided with Pearla bowl lights or shades. The dining room is equipped with one combination fan and ceiling fixture for a flat ceiling, and has four bulbs. Double bracket lights with shades are placed between the windows as in the observation compartment. Both the observation and dining room fans have special control for three speeds.

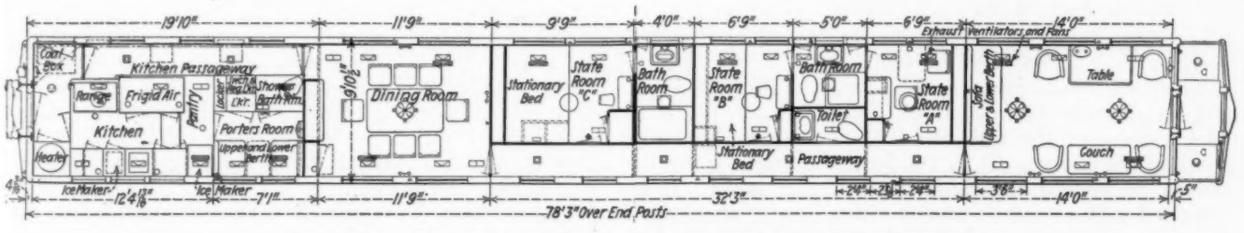
Duco was used for both the exterior and interior finish of the car. The observation room, stateroom *A*, and the stateroom passageway are finished with a natural mahogany wood grain. Stateroom *B* is finished in ashes of roses and striped with old rose, while stateroom *C* is finished in light orchid and striped with dark orchid. The dining room is decorated with a basic color of cape smoke and striped in rose. The bathrooms, toilets and porter's shower are finished in white where no tile or porcelain is used. Heathcote brown is applied below the window stooling in the kitchen, pantry, kitchen passageway, and porter's room, and DeBeers tan is applied above the window stooling up to the side plate molding, upper and lower deck headlining, tanks, etc. The interiors of all the lockers are painted in the same color as the walls of the room in which they are located. All heater pipe grilles are lacquered in statuary bronze. The exterior lettering and numbering is done in gold leaf.

Observation Room Furnishings

The observation room is equipped with overstuffed chairs and a gate-leg table, finished in mahogany. The sofa is built to form upper and lower berths, for which berth curtains of green goat's hair satin are provided. The dining room is equipped with an extension table, with places for six.

Special Equipment

The car is heated with the Vapor Car Heating & Lighting Company's vapor system of steam heat, arranged for separate control in each room and passageway. The kitchen is equipped with a large refrigerator arranged for Frigidaire, having two cooling units. The refrigerator is lined with opal glass, with a tile floor, and



Floor Plan of the Business Car for the Gulf, Mobile & Northern

has three-inch cork board insulation. The sinks and coverings for the tops of the kitchen and pantry tables are of Monel metal. An eight-tube Fada radio receiving

Interior of the Observation Room Looking Toward the Front of the Car

set and a phonograph are located in a cabinet in the dining room locker. Two loud-speaker jacks are located in the dining room and two in the observation room. The aerial is placed on top of the upper deck, about four inches above the roof.

Ventilators

Exhaust and intake ventilators of standard American Car & Foundry Company design are located in the upper deck. A 10-in. horizontal exhaust ventilator and a 12-in. vertical exhaust fan are provided in the kitchen. Two

Rear View of the Observation Room

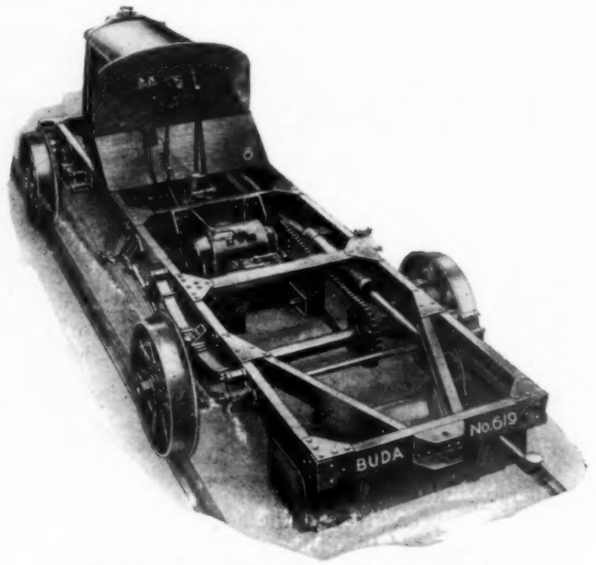
10-in. horizontal exhaust fans and ventilators are provided in the observation room, one in each of the three staterooms, two in the dining room (located in opposite corners), and one in the porter's room.

General Dimensions

The car has a length over the buffers of 84 ft. 3⅛ in., and the distance between truck centers measures 59 ft. The width over the side sills is 9 ft. 10½ in., and the width at the eaves is 10 ft. 1⅞ in. The height from the rail to the top of the roof is 14 ft. 2 5/16 in. It is equipped with six-wheel trucks which have a wheel base of 11 ft. The journals are 5½ in. by 10 in.

Buda Develops Heavy-Duty Motor Car

THE heavy-duty motor car, designated as No. 619, brought out recently by the Buda Company, Harvey, Ill., has sufficient power to adapt it to a wide range of uses, such as for large inspection parties, work-car service, hump-yard duty, transportation service on branch lines, and for light hauling and switching. To



Chassis of the Buda No. 619 Motor Car

facilitate these operations, the car is equipped with a special Buda design of reverse gear which permits it to be operated equally well in either direction.

The chassis, which is built like that of an auto-truck, is of steel construction, and can be furnished for loads of from 8,000 to 20,000 lb., depending on the engine

The Car Equipped for Hump Yard or Extra Gang Service

used. For inspection and transportation service, the car can be provided with any desired type of enclosed passenger-car body, or with a canopy top, side curtains, and either side or cross seats. For work-car service, it can be equipped with a platform body and fitted with a draw bar for hauling trailers. For hump yards, it can be equipped with a body having a full length superstructure and provided with running boards, wheel guards and safety rails.

The car may be equipped with any one of five different models of Buda four- and six-cylinder heavy-duty

gasoline engines, providing a range of from 37 to 114 brake horsepower. These engines are equipped with Eisemann magnetos, Zeneth carburetors and dash choke control, vacuum-tanks, cellular-type radiators, four-bladed fans, force-feed lubrication and oil pressure gages. Electric starting equipment may be furnished if desired.

Standard Type Transmission

The cars are made with either two or four-wheel drive, the wheel base being 8 ft. 6 in. for the former and 8 ft. for the latter, although a longer base can be furnished for a car body of extra length. The transmission is of the standard automotive type, with three speeds in each direction, the reverse gear permitting operation of the car in a backward motion by using the three forward speeds. The clutch is of the multiple disk type, while an internal-gear clutch is used for engaging the forward and reverse gears. The drive between the transmission and the reverse gear is through a universal joint of the flexible fabric type, and the final drive from the reverse gear to the axles is by means of a roller chain and sprockets.

The axles are of heat-treated nickel steel, with bearings of the enclosed roller type. Specially designed spring thrust plates are provided on the frame to prevent side sway of the car body, especially on curves, thus providing for the absorption of side sway by the frame and eliminating strains on the leaf springs. The cars can be built for any speed up to a maximum of 50 miles an hour, depending on the gear ratio, which can be made to suit different classes of service.

A New Insulating Material

A NEW insulating material being introduced in this country, known as Torfoleum, is said to have a wide range of application in the railway field, being adapted specially for all classes of temperature insulation up to 230 deg. F. This product, which at the present time is being manufactured in Germany, where it has had extended use, is being promoted in this country by Pennrich & Company, New York.

Torfoleum is manufactured from peat moss which has been treated by a special waterproofing process, and is furnished in sheets 19½ in. wide by 39 in. long, and in thicknesses ranging from 1 in. to 6 in. It has a finely porous texture and weighs less than 1 lb. per board foot. Many claims are made for this material, which is said to have a large compressive strength and low thermal conductivity. It is further claimed that this material is waterproof, non-capillary, rot-proof, fire retardant and free from harmful odor.

Its principal uses are for the insulation of refrigerating plants and refrigerator cars, and for practically all kinds of building construction. It is not only light in weight, but it can be readily cut or sawed and secured in place by either nails or adhesive materials. This material is also said to have efficient sound-absorbing qualities.

FRANK THOMSON MEMORIAL SCHOLARSHIPS, good for four years and worth each $600 annually, have been awarded to John A. Zapp, Jr., of Paoli, Pa., and Joseph P. Irwin of Palmer, Mass., sons of Pennsylvania Railroad employees. Mr. Zapp will enter Haverford College, while Mr. Irwin plans to enter the Massachusetts Institute of Technology.

Bankers' Views on Competitive Bidding

WASHINGTON, D. C.

LACK of interest in recent months on the part of bankers in equipment trust securities offered by carriers through competitive bidding raises some questions as to the merit of this method of distributing these issues, says a statement published by the National Association of Owners of Railroad and Public Utility Securities in its bulletin, "The Security Owner." In the past few weeks several well-known carriers who had invited bids from large numbers of banking houses are said to have been disappointed when only two or three tenders were made for their equipment obligations. The practice of competitive bidding for equipment trusts was approved and commended by the Interstate Commerce Commission in June, 1926, in connection with the granting to the Western Maryland of authority to assume obligation and liability in respect of an issue of such certificates. The reasons which moved the commission to this action were given in its report as follows:

> First, that securities of this character were virtually uniform and enjoy a high degree of safety as to payment of principal and interest, the prices which they bring being largely determined by interest rates current for the best class of security.
>
> Second, that the relative financial strength of the issuing carriers has ceased to be an important factor in determination of prices and that such securities were growing in favor with individual investors who have at times been willing to pay more for them than the investment institutions which had absorbed a larger part of such issues in former days.
>
> Third, that in view of the growth of the general investment market, absorbing as it does billions of securities other than those of railroads annually, it appeared to the Commission that the sale of these by public competitive bidding would tend to widen their market and thus produce capital more cheaply for the issuing railroads."

The association has been conducting an investigation, one phase of which was to secure an expression from bankers on this subject. Since it represents owners of very large amounts of railroad securities it also requested representative distributing houses to advise of their experiences in this connection, in order to determine whether or not competitive bidding for equipment trust securities has proved to be desirable.

As two years have elapsed since the commission put its stamp of approval upon this method, the association sought to determine if the method has had sufficient trial to warrant its continuation in view of the present lagging tendency in the market for these securities. In a large majority of cases the replies from the bankers indicate that their experience tends to show that the reasons which the commission gave for its approval of this procedure have not proved to be in substantial accord with the facts. It developed that, in the opinion of practically all of the distributing houses, the commission was too optimistic in considering such securities virtually uniform and with a high degree of safety. The statement continues:

> On the contrary, they are not uniform, as viewed by the financial experts, either as to legal provisions or the security behind them. This might have been more nearly the case had the commission prescribed a standard form of trust indenture. Necessarily, under circumstances where the commission's action is confined merely to adding its stamp of approval in cases where it finds that the proposals which are submitted are not incompatible with the public interest, instead of taking the initative in promulgating a standard form and practice, it follows that there are as many varieties of provisions affecting vitally the interests of the certificate owners as there are issuing carriers.
>
> An especially impressive point seems to be agreed upon by all bankers, namely, that where these trusts are prepared for public offering and competitive bidding by counsel for the issuing carrier, the legal provisions are for obvious reasons less attractive to prospective investors and afford them less

protection than where the trust provisions are drawn by bankers and their counsel. Knowledge of safeguards and protective clauses which would prove attractive to the institutions and other buyers who scan rigidly the provisions of these securities in order that they may be safely within the legal requirements of their respective jurisdictions is essential.

A more marked difference of opinion counter to the views of the commission expressed in its second reason for approving the competitive bidding procedure is disclosed in the statements of the bankers to the effect that, theory to the contrary notwithstanding, the equipment trust issues of identical form and similar security would not sell at the same prices in the market, where the relative financial strength of the issuing carriers is considered. There is no room for doubt, in the opinion of the bankers, that the market still gives a higher rating to the obligations of the strong credit roads. Moreover, the financial fraternity is strongly of the opinion that individual investors have not been willing to pay more for these securities than the institutional buyers, but on the other hand have withdrawn from the market whenever the yields are low. The responding banking houses are unanimous in expressing substantially this view where giving any opinion on the subject.

Doubtless the situation which prompted the commission to advance this second reason was the fact that in the history of equipment certificate financing only one default is recorded. This view perhaps was further advanced on the theory that the mobility of the trust equipment enables it to be run off the owning road, in case of default, and sold to other carriers who use standard equipment, thus imparting to this class of paper an individual credit status which sets it apart from that of the issuing carrier.

Even assuming this to be so, investors do not relish being involved in litigation to enforce the lien of their securities, however valid that lien may be, and it follows that where the issuing carrier's credit is weak there is a reflex in the market for its equipment paper.

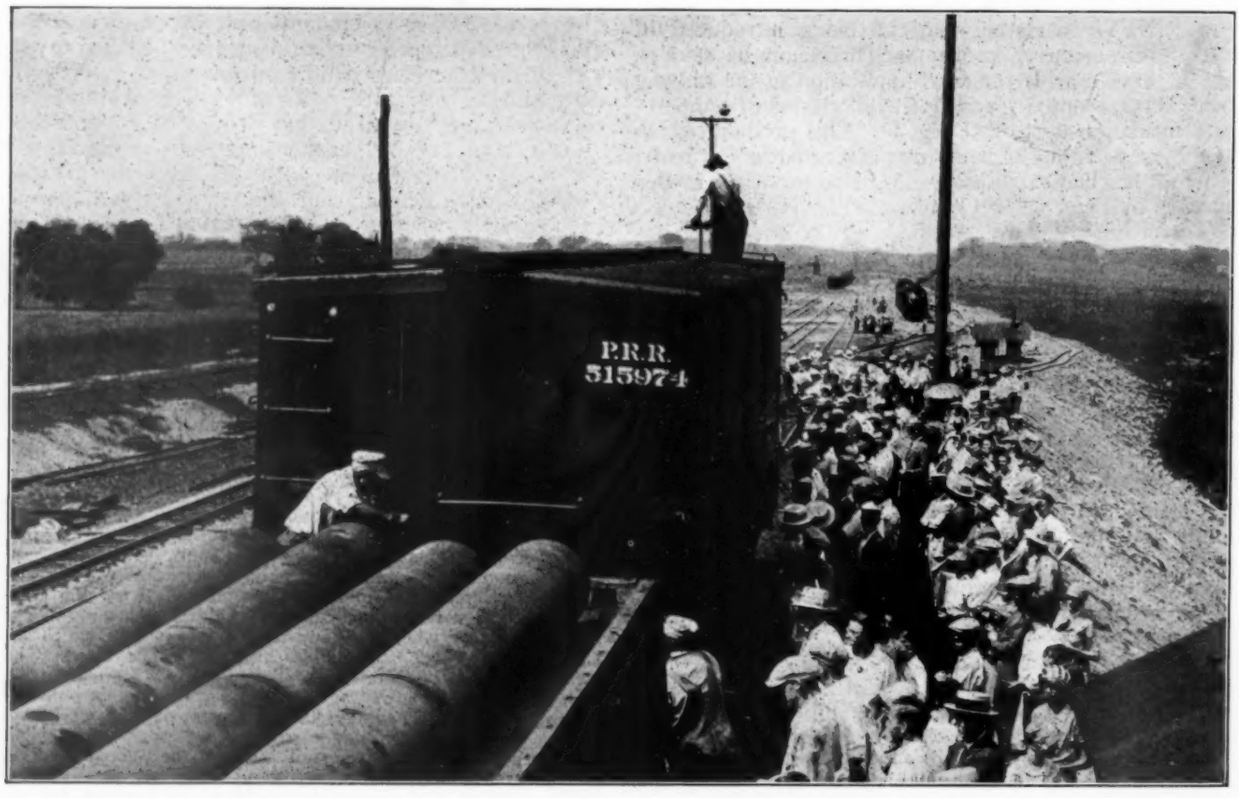
The third reason expressed by the commission is, to a considerable degree, involved with the first and concerning it there is some question whether the practice of competitive bidding really does broaden the market. Under the old plan certain large New York underwriting houses who are bankers for the railroads could purchase their equipment trust certificates and would frequently offer a participation in the sale of these certificates to a nation-wide list of dealers. Under the competitive bidding plan a number of these outstanding houses have withdrawn from the bidding, with the result that new accounts are formed by other dealers who are not able to interest as large a number of retailers scattered throughout the country in a participation of their offering as the older established houses referred to above.

It is apparent that where the spread between the purchase price and the selling price to the retailer is forced to so low a point as to be no longer remunerative of handling costs, to say nothing of compensating the ordinary risks of flotation, the business will not be attractive. Generally speaking, the tenor of responses received by the association appears to be that many of the banking houses are avoiding this class of paper and withholding bids while the specialists in equipments are turning to other classes of investment business.

A spread approaching one-half of one per cent is clearly unremunerative. So long as there was a rising market it was possible for retailers to overcome temporarily the handicap of a narrow spread. The surface indications in such a market did not disclose any lack of success for competitive bidding, inasmuch as the carriers had in fact procured their capital at the lower cost.

However, a change in the market trend such as that occasioned by the present credit situation makes it questionable as to whether or not this practice has not proved to be penny-wise economy. In difficult times when the carrier needs his financial friends, he may find them otherwise engaged and the valuable asset of substantial banking connection thus lost. We shall watch this situation very closely in the immediate future as investors may be misled by surface indications which for the past year or two seem to favor the practice of competitive bidding for a class of securities ordinarily requiring specialized salesmanship, lest the undercurrent result is a drift to congestion. Certainly any situation which makes for a narrowing of the inquiries for these securities is not to be looked upon without some apprehension. Even those who do not feel kindly disposed towards the investment banker would do well to appreciate the value of his services in the scheme of things financial where the railroads are concerned.

* * * *



Pushing the First Car Over the Hump at the Formal opening of the New Pennsylvania Classification Yard at Crestline, Ohio.

Communications and Books

Large Salt Train Handled in 1904

PITTSBURGH, PA.

TO THE EDITOR:

Permit me to correct an article appearing in your issue of August 18, page 325, on the world's largest shipment of salt ever made by rail. On January 8, 1897, President-elect McKinley pressed a button at Canton, Ohio, which automatically started what was then the world's largest shipment of any manufactured commodity. It consisted of 160 carloads of salt from the Silver Springs, N. Y., plant of the Worcester Salt Company. Most of this salt was sold contingent upon McKinley's election and that fact induced him to consent to press the button which automatically started the train. The train was routed over the Erie to destinations in New England.

In 1904 a shipment of 218 carloads of Worcester salt was routed over the Buffalo, Rochester & Pittsburgh to various points in New England. The New England Grocer of Boston, Mass., published a description of the train in its issue of October, 1904, saying "A great crowd was on hand with its cheers and good wishes to give the eleventh and biggest Worcester salt special a proper sendoff." This train was handled by the Buffalo, Rochester & Pittsburgh and the New York Central to Troy, N. Y., from which point the Boston & Maine handled it for distribution through New England.

R. R. WILLIAMS,
Assistant General Freight Agent,
Buffalo, Rochester & Pittsburgh.

Improper Replacement of Defective Draft Gears

NEW HAVEN, CONN.

TO THE EDITOR:

A communication signed by C. A. Porter, traffic manager, Indiana Refining Company, was published in the July 21 issue of the *Railway Age* under the heading, "Improper Replacement of Defective Draft Gears." I wish to take issue with Mr. Porter's statement in reference to the wasteful practice of substituting springs and followers for friction draft gears.

I wonder if it ever occurred to him to ask why the railroads substitute springs and followers for friction draft gears. It must be admitted that the supervisors of car departments of the various railroads know what it means to reduce the capacity of a draft gear. Furthermore, they are all well aware of the fact that such a practice is detrimental to the life of the car.

From my own experience, I know that in all cases where a car owner's standard draft gear cannot be maintained, a friction gear of the same dimensions is applied where possible. In nearly all cases where springs and followers have been substituted for a friction gear, it is because the car is equipped with a 15½-in. or 18½-in. pocket. Few railroads have friction draft gears to fit these pockets. Hence, they must find some other substitute.

If a tank car is shopped under load for a defective draft gear and it cannot be repaired, something must be done to move the car. If the car is equipped with A.R.A. standard pockets, any railroad company can make repairs by replacing the gear in kind, or substituting another gear which conforms to the same coupler pocket limits. But when one considers the various kinds of friction draft gears that are used by private car companies, it must be admitted that the railroads must either invest a considerable sum of money in many types of gears, or else find a good substitute. The later method, which is consistent with A.R.A. Rule 88, is used in most cases.

I agree with Mr. Porter that such repairs decrease the desired draft gear capacity. But such a repair is not wasteful and need not be "makeshift" if done properly. In cases of empty cars being shopped for defective gears, some railroads hold cars and order a gear standard to the car from the owners. Others make wrong repairs and move the cars home. It is a question whether or not the average car owner wishes to tie up a car for a number of days, thereby losing what revenue it may earn or have the car moved home and correct the wrong repairs themselves.

In either case, with empty or loaded car, the car owner will usually withdraw the car from service to correct these improper repairs. My contention is that the car owner is at fault in most cases because the car is not built in accordance with A.R.A. standard practice. This does not relieve from criticism any railroad company that wilfully substitutes springs and followers in place of friction gears when they could easily apply the friction gear to the car. This, in my opinion, is exactly what Mr. Porter has in mind.

JAMES MCDONNELL.

The Life of All-steel Cars

ANACONDA, MONT.

TO THE EDITOR:

Having read your article in the *Railway Age* of July 21, 1928, relative to the life of the all-steel hopper car, it appears to me that the life of an all-steel car is still an open question.

The Butte, Anaconda & Pacific has four cars Nos. 1203, 1207, 1209 and 1211, which were purchased and placed in service in February, 1899. These cars were built by the Schoen Pressed Steel Car Company, with a pressed steel arch bar type of truck and journals 5-in. by 9-in. The trucks were later rebuilt to accommodate the 5½-in. by 10-in. journal, and the cars were marked 100,000 lb. capacity. These cars have been used almost continuously in the heaviest kind of service over mountain grades hauling ore from the mines at Butte, Mont., to the smelters at Anaconda, and have run approximately 370,650 miles.

The center and draft sills have been spliced three times and renewed on one car. About four years ago the cars were taken in for heavy repairs consisting of half floor sheets, inside hopper sheets, cross ridge sheets, hopper hoods and hooper doors. The side sheets show no appreciable wear, and the cars now seem good for another 25 or 30 years. Thus it seems that the life of an open-top all-steel car may, in some cases, be placed at 55 or 60 years. However, this seems to depend almost entirely on the following conditions: First, the manner of upkeep; second, the climatic conditions; third, the kind of commodity hauled, and, fourth, the length of time the cars remain under load. We are operating in a high dry climate, and the cars are usually made empty the same day they are loaded.

P. S. EVERETT,
Master Car Builder.

New Books

Proceedings of the American Railway Engineering Association. Volume 29, 1928. 6 in. by 9 in., 1,449 pages, illustrated. Bound in cloth. Published by the association, E. H. Fritch, secretary, 431 South Dearborn Street, Chicago.

The annual proceedings of the American Railway Engineering Association contain the reports of 22 standing and 3 special committees presented before the convention last March, together with the discussions thereon. In addition, 15 monographs issued during the year are also included. Features of special interest are found in the rail committee's description of the car developed under its auspices for the detection of transverse fissures, and its progress report on the causes and prevention of rail battering; a plan suggested by the Committee on Yards and Terminals for a typical large hump classification yard; and a discussion by the Committee on Economics of Railway Operation on the effect of the introduction of motor trucks and coaches on railway operation, with particular reference to branch and feeder lines.

Among the monographs of particular interest is one on highway grade crossings by R. H. Ford, assistant chief engineer of the Chicago, Rock Island & Pacific; two on sink head ingots and the characteristics of rails rolled from them, by R. H. Harden, office engineer on the Pennsylvania Railroad, and Dr. George K. Burgess, chief of the Division of Metallurgy of the Bureau of Standards, and several monographs which deal with the various phases of the purification of feed water for locomotives and stationary steam-power plants.

The report of the Special Committee on Convention Procedure and that of the Special Committee on Standardization are of general interest, the first of these dealing with the changes which should be made in the conduct of the work of the association in order to make it more effective, while the second treats of the extent and also the degree to which the recommendations of the association have been adopted by the various roads.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

The Economics of Railroad Valuation, by Arthur S. Dudley. The author is Tax Commissioner of the C., M., St. P. & P. and this discusses principles involved and procedure in valuation of railways for taxation. 94 p. Pub. by the Author, c/o Chicago, Milwaukee, St. Paul & Pacific, Milwaukee, Wisc. *Apply.*

Timber. Tenth report of the Reports of the Imperial Economic Committee on sources, and uses of timber in British Empire, and methods of stimulating further use. For unusual railway uses see pages 50-52. 52 p. Pub. by H. M. Stationery Office, London, Eng., 9 pence. Available in this country at British Library of Information, New York City.

Principles of Transportation, by Emory R. Johnson, Grover G. Huebner, and G. Lloyd Wilson. Part I deals with Railroad Services, Part II with Railroad Business Methods and Organization, Part III with Railroad Rates, and Part IV with Government Regulation of Railroads. Part V takes up Motor and Highway Transportation, Part VI, Transportation by Water, (ocean and inland), and Part VII, Air Transportation. Indexed. 815 p. Pub. by D. Appleton & Co., New York City. $5.

Periodical Articles

South African Railways Locomotive Program for 1927-28, by Edward B. Lawson. Types ordered and where. Commerce Reports, August 27, 1928, p. 539.

'Success to the Railroad' Flask, Engine Type. A less common type than the one noted in an earlier Booklist. Illustrated. House Beautiful, September 1928, p. 280.

The Cost of Weather, by Charles Fitzhugh Talman. Some varieties and the costs of each in money. Illustrated. Nation's Business, September, 1928, p. 43-45.

Mechanical Engineering in Iron-Ore Industry, by A. Tancig. Along with "features of steam shovels" the author describes types of ore-hauling cars, locomotives and locomotive cranes used. Mechanical Engineering, September, 1928, p. 675-682.

Transsaharien et Transafricain, by General Levé. The French project for a Trans-Sarahan Railway, the almost-completed Cape-to-Cairo, and an Italian project, and what each entails. Revue Politique et Parlementaire, August 10, 1928, p. 196-209.

Le Problème Sanitaire au Congo Belge, by Dr. Brutsaert. The Belgian Government, missionaries, railroad and mining companies are fighting disease in the Belgian Congo and this narrates what each is doing, with what forces and facilities, and at what cost. The railroads are the Upper Congo-African Lakes (p. 164-165), Congo Railway (p. 166), Katanga Railway (p. 161), Leopoldville-Katanga-Dilolo (p. 161-162). Revue Economique Internationale, July 1928, p. 125-176.

Looking Backward

Fifty Years Ago

An accident to an excursion train in Michigan on August 28 resulted from a very unusual cause. It occurred on the Grand Rapids & Indiana [now part of the Pennsylvania], whose gage is 4 ft. 9½ in. The cars which left the track were from the Flint & Pere Marquette [now part of the Pere Marquette] which has a gage one inch narrower, the excessive play between the wheels and the rails forcing one or more of the trucks from the track.—*Railway Age,* September 5, 1878.

The management of the Connecticut River railroad [now part of the Boston & Maine] did an unusual thing in railway financial procedure when it paid in full the matured bonds which were due on September 1 without issuing any new notes to take the place of the retired bonds. These bonds were originally issued in 1858 and since that time the price of the stock has risen from $35 to $131 per share.—*Chicago Railway Review,* September 7, 1878.

The Central Pacific [now part of the Southern Pacific] has had in operation since 1869 at Sacramento, Cal., a hospital for the care of its sick and injured employees. The four-story building, which will accommodate 125 patients, was built at a cost of $68,000 and is maintained by "hospital dues" of 50 cents per month, which are collected from every officer and employee. During those eight years an average of 466 patients have been admitted to the hospital and 1,041 patients have been given outside medical attention each year.—*Railway Age,* September 5, 1878.

Twenty-Five Years Ago

In order to provide employment for men who have grown old in its service, the Erie has called for the resignation within 30 days, of all clerks in the various departments who have been taken into employment since May, 1901, who are over 35 years of age.—*Railway Age,* September 11, 1903.

The Pennsylvania has made a speed test which seems to indicate that it is practically impossible to attain a speed of 100 miles per hour with a commercial locomotive. The trial was made on a 25-mile stretch of track with slightly descending grade, at the foot of which was a mile of level track equipped with electric circuit breakers and a recording apparatus. The trial started with eight coaches and with each succeeding failure to obtain the desired speed a coach was dropped until with the engine alone a speed of 95.1 miles per hour was reached.—*Railway and Engineering Review,* September 5, 1903.

Ten Years Ago

Charles A. Morse, heretofore chief engineer of the Chicago, Rock Island & Pacific, has been appointed assistant director of the division of operation of the Railroad Administration in charge of engineering and maintenance and has assumed his new duties at Washington.—*Railway Age,* September 6, 1918.

The total amount of money which the director general of railroads has disbursed, over and above all current expenses of operation, out of earnings of the railroad properties since January 1, 1918, and from current balances taken over on that date and from the Treasury's Revolving Fund, up to September 1, is estimated at between $800,000,000 and $900,000,000.—*Railway Age,* September 6, 1918.

Director-General McAdoo, on September 5, issued an order granting increases in wages to nearly 1,000,000 employees of railroads under federal control. The order affects clerks and station, warehouse and miscellaneous employees and all maintenance of way employees. The increase amounts to about $25 per month for employees paid on a monthly basis and 12 cents per hour for those on an hourly basis.—*Railway Age,* September 6, 1918.

Odds and Ends of Railroading

Howard Melaney, the "singing fireman" of the Northern Pacific, has traveled since January 1 the equivalent of five times around the world in filling radio engagements; 4,000 miles a week has been his average, a total of 128,000 miles. In that period his lyric tenor voice has been heard by millions of persons, from radio studios in New York, Chicago, Buffalo, Cleveland, Atlantic City, Detroit, Milwaukee, St. Louis, Kansas City, Los Angeles, San Francisco, Portland, Seattle, Spokane, St. Paul, Minneapolis, and 25 other cities.

C. & N. W. Employees Win Praise

Employees on the Chicago & North Western recently built, out of their spare time and earnings, a gateway to the playground at Emerson, Neb., which caused a letter of appreciation to be written to President F. W. Sargent by the Emerson Commercial Club. Seventeen employees donated their time and labor for building the stone gateway during evenings, after working hours, contributing 206 hours of labor. Twenty-four employees, many of whom also gave their time and labor, contributed $40 for the building materials.

Embryo "Hogsheads"

The boys who belong to the Junior Railway Club of New York have an ambitious model railroad, whereon they learn to do every job connected with operating a railroad. No boy older than 17 or younger than 11 can belong to the club. In the main room of the club there have been built mountains and rock formations. There are 3,600 ft. of main track laid over and through these artificial mountains and it takes 37 boys to run the railroad. Twenty trains may be run at one time and the boys act as telegraph operators, tower men (they check up on the position of trains in their division by means of their tower lights), switchmen, and all the other jobs that are required to run a railroad.

Keeping Cool

St. Louis, rightly or wrongly as the case may be, has the reputation of being a hot place in the summer. But the occupants of the 22nd floor of the new Missouri Pacific building need not suffer. This floor is refrigerated artificially and the temperature never gets above 78, sometimes being as low as 60 degrees, regardless of the heights to which the thermometer may climb outside. The cooling system was worked out by the M. P. architect and is connected with the elaborate system of conduits carrying refrigerator pipes, which underlies the St. Louis streets. These pipe lines were originally installed to carry refrigeration to saloons, but the service is now used by restaurants, soda fountains, candy stores and markets. The M. P. installation is the first to be used in an office building in St. Louis.

French Railroading

Christopher Morley, author and critic, reports the receipt of the following from a station master at Donville-Triage, France. The package referred to was dispatched from the Filbert street station in Philadelphia.

"There is arrived in the station addressed to you, dispatched by Mr. Filbert, Saint Phila, merchandise as folows:

1 Packet
which are at your disposition against the sum of
0 Fr. 86 for carriage
0 Fr. 25 for expense of notification
Total 1 Fr. 11

"I pray you to have these merchandises carried away immediately, warning you that at the expiration of the hereinunder indicated delay they will be submitted to the legalities of storage determined by tariff.

"The person who will take delivery in the station will have to be bearer of the present letter fortified by your signature at the bottom of the following notice.

"If they were not lifted away from the station in 48 hours from the putting to post of the present letter of advice, they would be able to be trucked away from the office, and without other warning, into a public magazine, where they would remain at your disposition.

"I have the honour to salute you."

Cars of Babel

Passenger conductors in this country have a fairly easy time of it, as compared with Swiss conductors, who have to deal with trainloads of passengers speaking dozens of different languages. In fact, on the through expresses, most of the conductors are accomplished linguists. They come through the trains shouting: "Fahrkarten, billets, tickets," and are prepared to understand and answer questions in four or five languages.

The cars also present an interesting exhibit of the confusion of tongues. The continental railways believe in numerous signs, posted in conspicuous places in every coach, dealing with the location of the emergency brake, and commands not to spit, not to lean out of the window and not to smoke. All of these signs must be printed in several languages. This is particularly true in the case of through cars, traversing several countries, as the Paris-Constantinople cars, for example. There is one advantage gained, however, by the constant repetition of warnings. For example, take the sign which has this printed on it in large letters:

Defense de fumer!
No smoking!
Nit rooken!
Ne fumari!
Nicht rauchen!

A man must be brave to light his pipe when he has been expressly ordered not to do so in from five to a dozen languages.

Dobbin Is Still With Us

For years curious persons have asked, time without number, where the horse has gone to—and the answer has been right before them all the time. During all that time the horse has been going to the railroad stations and he's still going there—along with the taxicabs. A traffic survey just made for the city officials of Cincinnati, Ohio, by the chief engineer for the new union terminal, shows that a large portion of the traffic consists of horse-drawn vehicles, in spite of the great inroads made by motor trucks. His survey shows also that the taxicab traffic is unusually heavy, being three times that of private automobiles, which indicates, rather conclusively, that the average man on his way to a station uses a taxicab, rather than a private car, three trips out of every four.

The report showed that 8,004 vehicles of all classes stopped at the various stations. Freight vehicles predominated over passenger vehicles, 4,321 carrying freight to 3,682 carrying passengers. Of the total, motor vehicles predominated over horse-drawn vehicles, there being 731 horse-drawn vehicles and 7,273 motor vehicles. This is a much higher percentage of horse-drawn vehicles than ordinarily is noted on city streets, however.

There were 901 private cars and 2,578 taxicabs in the 17-hour survey. This is at the rate of 53 private cars and 152 taxicabs an hour. Motor coaches numbered 204, almost one-fourth as many as private cars, while motor trucks and commercial vehicles numbered 209. There were only 18 horse-drawn trucks in this classification.

The horse-drawn vehicles were greatest in the express service. Of the total of 731 horse-drawn vehicles, 582 were express wagons. Against these were 1,325 express trucks. Horses drew 128 mail wagons during the day, but 1,693 other mail wagons were motor-driven. Motor baggage wagons numbered 271. There were 92 motor-driven milk wagons, but only three horse-drawn wagons.

NEWS *of the* WEEK

Baltimore & Ohio, No. 7, Leaving Philadelphia.

CHICAGO & ALTON EMPLOYEES will hold their first annual picnic and field day at Jacksonville, Ill., on September 22.

THE AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS will hold its annual meeting at Colorado Springs, Colo., on September 25 and 26 instead of in October.

Milwaukee Veterans

Approximately 1,500 veteran employees of the Chicago, Milwaukee, St. Paul & Pacific attended the tenth annual convention of the Veterans' Association at Milwaukee, Wis., on August 27 and 28. This association has a membership of 5000. Every man present had served 25 years or longer with the railroad. H. A. Scandrett, president, was the principal speaker at the banquet on August 27. On the 28th, a special train transported the convention group to Pewaukee where boats conveyed the crowd to Waukesha beach for the annual picnic.

N. C. & St. L. Adopts Symbol

The Nashville, Chattanooga & St. Louis has adopted the symbol, "The Dixie

Line," in sympathy with the part played by that road in the history, romance and development of "Dixie Land" and in harmony with its *"Dixie Flyer"*, its *"Dixie Limited,"* etc.

Wage Statistics for May

The number of employees reported by Class I railways as of the middle of the month of May was 1,709,721 and the total compensation was $242,880,334, according to the Interstate Commerce Commission's monthly statement of railway wage statistics. Compared with the returns for the corresponding month last year, the summary for May, 1928, shows for every reporting group a decrease in the number of employees and in the average number of hours of all employees per working day. The total number of employees decreased 83,420, or 4.65 per cent. Owing to an increase in the average hourly earnings, and the fact that May, 1928, had one more working day than May, 1927, the total compensation decreased only 2.51 per cent. Of the decrease of 83,420 in the total number, 23,063 were in the maintenance of way and structures group, 28,147 in the maintenance of equipment and stores group, and 11,536 in the transportation group.

Union Pacific Athletic Meet

The Union Pacific Railroad won first place in the Union Pacific System athletic meet held at Boise, Idaho, on August 27, with a total of 257 points, while the Oregon-Washington Railroad & Navigation Company was second with 209, the Oregon Short Line third with 154 and the Los Angeles & Salt Lake fourth with 153.5 points. This is the fourth consecutive time that the Union Pacific has won the system meet, which includes trap shooting, rifle shooting, tennis, golf, swimming, track and field events, baseball and horseshoe pitching. Within one year the membership in the Union Pacific athletic league has increased from 10,000 to 18,000 while the number of clubs has increased from 34 to 70. At the banquet which terminated the day's activities, E. E. Calvin, vice-president, described the early days of the Union Pacific. A. C. Hinckley, retired superintendent of motive power and machinery, acted as toastmaster.

B. & M. Completes Double-Tracking of Branch

With the opening to traffic of its Stony Brook branch on a double-track basis, trains of the Boston & Maine are now able to operate from Worcester, Mass., to Portland, Me., and from Rotterdam Junction and Mechanicville, N. Y., with passing facilities at every point. Nine miles of second track, costing $650,000, have been constructed on this branch, which extends from Ayer to Lowell, Mass. The project also involved the easing of grades and the strengthening of six bridges.

The new second track laid between Willows Station and West Chelmsford, Mass., lies midway on the Boston & Maine's longest east and west haul, between Rotterdam Junction and Mechanicville, N. Y., and Portland, Me.—approximately 300 miles—all of which now has continuous two way operation.

Fuel Consumption

The average cost of locomotive fuel charged to operating expenses by Class I railways, excluding switching and terminal companies, in June, was $2.55 as compared with $2.63 in the corresponding month of last year, according to the Interstate Commerce Commission's monthly statement of locomotive fuel statistics. These figures include direct freight charges. Excluding freight charges the average cost was $2.14 as compared with $2.20 in June of last year. For the six months ended with June the railways consumed 56,640,000 tons of coal, at an average cost of $2.56, as compared with 58,793,914 tons, at an average cost of $2.67, in the corresponding period of last year. They also used 1,165,075,886 gallons of fuel oil at an average cost of 2.56 cents a gallon, making the total cost of coal and fuel oil $172,336,073 for the six months, as compared with $191,063,857 last year.

The C. P. R. in July

An increase of $572,772 in the net earnings of the Canadian Pacific is shown for the month of July, as compared with the same period last year. Net in this July was $3,699,558, as compared with $3,126,786 in July last year. Gross earnings for July, when compared with July, 1927, show an increase of $1,957,398, while by the same comparison operating expenses are higher by $1,384,626. July gross was best for any July in the history of the road.

For the seven-month period ended with July, net shows an increase of $4,012,209 over the corresponding period of last year, standing at $20,151,296, as compared with $16,139,086. Gross earnings for the seven-month period show an increase of $10,820,637 over the corresponding period of last year, while operating expenses increased by $6,808,427.

The statement of earnings and expenses for the month of July, 1928, and for the first seven months of the year, with comparison, follows:

	July, 1928	July, 1927	Increase
Gross	$17,986,111	$16,028,713	$1,957,398
Expenses	14,286,553	12,901,927	1,384,626
Net	$3,699,558	$3,126,786	$572,772
	Seven months ending		
	July, 1928	July, 1927	Increase
Gross	$115,691,914	$104,871,277	$10,820,637
Expenses	95,540,618	88,732,191	6,808,427
Net	$20,151,296	$16,139,086	$4,012,209

Brotherhood Approve Strike Proceedings

The members of the Brotherhood of Railroad Trainmen and of the Order of Railway Conductors have voted by large majorities to give full authority to the officers in the matter of the wage controversy with railroads in western territory, including power to call a strike.

The count of ballots was completed in Chicago on September 4, and the general union chairmen for each railroad then met to confer with the general officers of the brotherhoods on the plan of settlement which the presidents of the brotherhoods had agreed upon with Chairman J. W. Higgins at Washington on August 28.

The legislative committee of the Illinois Manufacturers' Association has sent a letter to the United States Board of Mediation protesting the use of the railway labor act as a means of settling wage disputes, claiming that under its provisions the public interest is not adequately protected.

Santa Fe Employees Hold Pageant Parade

The annual picnic of the employees of the Atchison, Topeka & Santa Fe at Topeka, Kansas, on August 29, was featured by a pageant parade made up of 38 sections depicting the rise of civilization in the Western states and the simultaneous development of transportation. The first division of the parade included a float which represented the cliff dwellers in the prehistoric days. This was followed by a section representing the Spaniards, with General Francisco Vasquez de Coronado and his followers on their expedition into Kansas about the middle of the sixteenth century.

A group of mounted Indians from Mayetta, representing the Sac, Fox, Iowa, Kickapoo and Pottawatomie tribes followed Coronado. Spanish influence on the development of the West and Middle West was depicted by a float representing the missions at Ranchos de Taos which were built in 1617. The Indian travois, a mode of transportation used by early Plains Indians, followed and after this came a float illustrating the Indian mode of smoke signaling, members of the Hopi Indian tribe being shown sending signals from a mound in the desert. Next was an Indian village in the pioneer period of the Santa Fe Trail.

The second division illustrated the covered wagon, of 1860-65, and the sod shanty; followed by five sections furnished by the American Railway Express Company representing the pony express and a stage coach, etc.

The next division represented the early days of white settlement and included cavalry scouts, the pony express, the gold rush to California in 1847, and Colonel Holliday's dream of a trans-continental railroad. A reproduction of the office building formerly located in Atchison, in which meetings were held in 1857 to organize the present Atchison, Topeka & Santa Fe, was shown on one float. Engineering and construction camps were shown followed by a replica of the first locomotive and train on the Santa Fe, (1869). Another section showed the frontier social life, including a reproduction of a saloon and dance hall with characters of that period.

A reproduction of an early pay car and locomotive used in the eighties and nineties preceded a model of the first Santa Fe general office building in Topeka and a float showing employees in the building at work.

Old and new systems of signaling on the Santa Fe were shown on a float and this was followed by another which contained old and new systems of telegraphy. The present general office building was shown in a section that was followed by a replica of the Santa Fe's modern de luxe train "The Chief." A modern freight train and an airplane also were included.

Revenues and Expenses for July

Class 1 railroads in July had a net railway operating income of $95,226,267 which, for that month, was at the annual rate of return of 4.34 per cent on their property investment, according to reports compiled by the Bureau of Railway Economics. In July, 1927, their net railway operating income was $85,135,153, or 3.97 per cent. Operating revenues for the month amounted to $512,953,453, an increase of six-tenths of one per cent, as compared with July, 1927. Operating expenses totaled $375,489,900, a decrease of 2.2 per cent.

Class I railroads in July paid $32,592,568 in taxes, an increase of 4.1 per cent over the same month in 1927. This brought their total tax bill for the first seven months in 1928 to $214,456,224, a decrease of $2,216,970 or one per cent.

Twenty-one Class I railroads operated at a loss in July of which six were in the Eastern district, five in the Southern and ten in the Western.

For the first seven months the net railway operating income amounted to $557,251,433, at the annual rate of 4.36 per cent. During the corresponding period of the preceding year the net amounted to $558,133,495 or 4.47 per cent.

Operating revenues for the seven months amounted to $3,419,809,817, compared with $3,534,617,731 during the corresponding period in 1927 or a decrease of 3.2 per cent. Operating expenses totaled $2,581,155,648, a decrease of 4.2 per cent.

Net railway operating income by districts for the first seven months, with the percentage of return based on property investment on an annual basis, was as follows:

New England Region	$ 21,203,549	4.45%
Great Lakes Region	104,732,868	4.77%
Central Eastern Region	127,427,634	4.72%
Pocahontas Region	38,752,691	6.69%
Total Eastern District	292,116,742	4.91%
Total Southern District	70,670,890	4.03%
Northwestern Region	55,092,945	3.45%
Centralwestern Region	91,546,375	3.84%
Southwestern Region	47,824,481	4.32%
Total Western District	194,463,801	3.82%
UNITED STATES	557,251,433	4.36%

The net railway operating income of the Class I railroads in the Eastern district for the first seven months totaled $292,116,742, at the rate of 4.91 per cent. For the same period in 1927 their net was $308,325,034, or 5.30 per cent. Operating revenues in the Eastern District totaled $1,696,063,092, a decrease of 5.4 per cent, while operating expenses totaled $1,270,-147,987, a decrease of 6 per cent. For July the net railway operating income was $48,479,077, compared with $46,617,691 in July, 1927.

Class I railroads in the Southern District for seven months had a net of $70,-670,890, at the rate of 4.03 per cent. For the same period in 1927 the net was $78,-390,228, at the rate of 4.60 per cent. Operating revenues for the seven months amounted to $448,130,367, a decrease of 6.6 per cent, while operating expenses totaled $343,983,580, a decrease of 6.1 per cent. The net in July totaled $8,263,091, while in the same month in 1927 it was $9,177,338.

Class I railroads in the Western District for seven months had a net of $194,463,-801, at the rate of 3.82 per cent. For the first seven months in 1927, they had a net of $171,418,233, at the rate of 3.45 per cent. Operating revenues in the Western district for seven months amounted to $1,275,616,-358, an increase of 1.1 while operating expenses totaled $967,024,081, a decrease of one per cent. For July, the net amounted to $38,484,099, as compared with $29,-339,854 in July, 1927.

Class I Railroads—United States

	Month of July	
Total operating revenues	$512,953,453	$ 509,678,377
Total operating expenses	375,489,900	383,913,386
Taxes	32,592,568	31,308,317
Net railway operating income	95,226,267	85,135,153
Operating ratio—per cent	73.20	75.32
Rate of return on property investment	4.34%	3.97%
	Seven months ended July 31st	
Total operating revenues	$3,419,809,817	$3,534,617,731
Total operating expenses	2,581,155,648	2,694,463,568
Taxes	214,465,224	216,682,203
Net railway operating income	557,251,433	558,133,495
Operating ratio—per cent	75.48	76.23
Rate of return on property investment	4.36%	4.47%

CONSTRUCTION of a 29-mile electric railway, the first on the islands, has been authorized by the Bermuda government. It is planned to complete the first 10 miles during the current year. Directors of the proposed railway are all officials of British railroad companies. The project is expected to cost more than $1,000,000.

Traffic

A "smut control train" is the latest device employed by a railroad company to aid the farmers; this train is one which is being run by the Reading Company in coöperation with the Pennsylvania State College. It spent the day at Hummelstown, Pa., on September 7. Farmers are instructed in the operation of a machine to treat wheat with a view of preventing the disease referred to, which is said to have caused a loss of a million bushels of wheat in the state of Pennsylvania last year.

Regulations for Shipments to Cuba

Proposed changes in certain paragraphs of freight tariffs governing the movement of freight from the United States to Cuba were the subject of a recent conference at the Department of Commerce in Washington, called with a view to correcting certain irregularities. Participating in the conference were representatives of the state department, of the Interstate Commerce Commission, of the Institute of American Meat Packers, and the Florida East Coast Railway. The proposed regulations, which will be submitted to American and Cuban railroads in the near future include the following:

The acceptance of Weighing and Inspection Bureau certifications jointly by Cuban and American carriers; the establishment of uniform practices for extra charges such as might be assessed on packing house produce in movement to Cuba; and the establishment of a joint arrangement to assure that delivery receipts would carry a full and accurate description of the goods upon delivery and grant all proper exceptions.

Begin Operation of Co-ordinated Rail-Air Services

Co-ordinated rail and air passenger service, the first of its kind in the United States, was inaugurated on September 1, when the Transcontinental Air Transport, through its subsidiary, the Northwest Airways, began the operation of passenger planes between Chicago and Minneapolis and St. Paul, connecting at both terminals with through trains to the East and West. The new service, which saves a business day on through trips between eastern cities and points west of the Twin Cities, is provided through arrangements made by the Northern Pacific, the Great Northern and the Chicago, Milwaukee, St. Paul & Pacific in the West and the Pennsylvania (which is financially interested in the Transcontinental Air Transport) in the East. Twelve passenger monoplanes, having a high speed of approximately 140 miles an hour and a cruising speed of 115 miles are being operated in the air service. A more complete description of this service was published in the *Railway Age* of July 28, page 168.

Beginning September 8, overnight passenger service between Chicago and New York, about three hours better than the best all-rail time, is available as the result of the operation of passenger airplanes by the Universal Air Lines between Chicago and Cleveland, Ohio. The planes make connections at Cleveland with eastbound and westbound through trains of the New York Central. The New York Central is co-operating with the Universal Air Lines to the extent of taking reservations for seats on the planes, but no joint ticketing arrangements have been made. In going from Chicago to New York, passengers may leave the Municipal Airport at Chicago by airplane at 5:20 p. m., daylight saving time, and fly to Cleveland, reaching there in time to board the eastbound Southwestern Limited of the New York Central, which arrives at New York at 9:50 the next morning. West bound passengers may leave New York at 6 p. m., transferring to an airplane at Cleveland early in the morning and completing the trip by air, arriving at Chicago at 8:45 a. m. Seven-passenger cabin monoplanes, capable of maintaining a cruising speed of 120 miles an hour, are being operated in this service by the Universal Air Lines.

Passenger Officers to Consider Many Subjects

The American Association of Passenger Traffic Officers has docketed many subjects for consideration at its annual meeting to be held at Colorado Springs, on September 24 and 25. Outstanding among these is the adjustment of services and expenses to meet existing conditions, which includes the pooling of train service between common points, and the staggering of schedules to provide adequate service at minimum cost. The outstanding experiences of 1928 in the development and retention of passenger traffic and the results obtained from tourists and convention fares, cheap excursions and other expedients to increase revenue, including methods used to meet the competition of the motor coach, the automobile and the airplane, will also be discussed. Another subject docketed is the substitution of rail motor cars for steam trains. It has been suggested that railroads which have operated motor driven cars on rails should present a comparative report of passengers, revenues and expenses under such operation. Shipment of automobiles by passenger train in connection with tourist travel will be considered.

The phases of airplane travel which will be discussed, include competitive possibilities as affecting long distance traffic, the use of the airplane in combination with the railroads and the service now in effect. Other subjects docketed include the relations with tourist agencies, the results of the operation of the General Folder Distributing Agency of the Western, Southwestern and Transcontinental Passenger Associations, the refinements of service to increase the attractiveness of rail travel, including roller bearings, electrification, ventilation, "room cars" and other innovations, dining car service, advertising and the results from "save to travel" associations.

Equipment and Supplies

Locomotives

THE CENTRAL LAFAYETTE OF PORTO RICO has ordered 1 Mogul type locomotive from the Baldwin Locomotive Works.

THE BANGOR & AROOSTOOK has ordered 1 eight-wheel switching locomotive from the American Locomotive Company. This locomotive will have 25 by 28 in. cylinders and a total weight in working order of 222,000 lb.

THE CANADIAN NATIONAL is inquiring for 55 locomotives.

Freight Cars

THE GREAT NORTHERN has placed an order for 2,000 steel underframes in its own shops. Inquiry for this equipment was reported in the *Railway Age* of August 11.

THE ILLINOIS TRACTION SYSTEM is inquiring for 100 box cars; this is in addition to its inquiry for from 100 to 200 composite gondola cars, reported in the *Railway Age* of August 18.

Machinery and Tools

THE NILES-BEMENT-POND COMPANY has received, from the railways, orders for a combination journal-turning and axle lathe, and a 16 in. by 36 in. Pratt & Whitney lathe.

Iron and Steel

THE CHESAPEAKE & OHIO is inquiring for 9,000 tons of tie plates and 5,000 tons of angle bars.

THE WABASH is inquiring for 200 tons of structural steel for a passenger station on Delmar avenue, St. Louis, Mo. This company has ordered 150 tons of structural steel for a freight house at St. Louis, from the Stupp Brothers Iron Company.

THE CLEVELAND UNION TERMINALS COMPANY has ordered 1,400 tons of structural steel for subway work in Cleveland, Ohio, from the Carnegie Steel Company.

Signaling

THE PENNSYLVANIA has ordered from the Union Switch & Signal Company material for an electro-pneumatic interlocking at Lancaster, Pa.; 46 working levers.

THE GREAT NORTHERN plans to install automatic color-light block signals on its line between St. Cloud, Minn., and Moorhead Junction, about 165 miles, at a cost of $400,000. This installation will complete (early in 1929) the automatic signaling of both Great Northern routes from St. Paul-Minneapolis to Fargo, N. D., and will give this railroad a total of 2,157 miles protected by block signals.

Supply Trade

The Globe Steel Tubes Company is making improvements at its works in Milwaukee, Wis. The work includes replacing one tube rolling mill unit and installing modern machinery, all machinery to have electric drives. This involves additions to the electric power plant and some changes in buildings.

C. E. Plummer has been appointed chief chemical and metallurgical engineer of the **Robert W. Hunt Company**, with headquarters in Chicago.

L. O. Cameron, Munsey building, Washington, D. C., has been appointed special railroad representative in the Central Atlantic district, for the **Baker-Raulang Company,** Cleveland, Ohio.

Benjamin F. Faunce resigned on September 1, as superintendent of the car department of the Cambria plant of the **Bethlehem Steel Corporation,** to devote his time in future to the operation at the Sheridan plant of the **Brown-Fayro Company,** Johnstown, Pa., manufacturers of machine boilers, coal and ore tiples, etc. **Lindsay C. Pritner,** assistant superintendent of the car department, has been appointed superintendent of that department to succeed Mr. Faunce.

A. C. Cronkrite, division sales manager for Chicago for the **Universal Portland Cement Company,** has been appointed assistant general sales manager and will be succeeded by **W. L. Greenly,** division sales manager at Duluth, Minn., who in turn will be succeeded by **Earle D. McKay,** of the service bureau. **Edward Quebbeman,** division sales manager for Illinois, has been appointed western sales manager and **Harry A. Craig,** assistant to the division sales manager for Indiana, has been appointed division sales manager for Illinois and Missouri.

J. A. Carmody, superintendent of electrical equipment of the New York Central, at New York, resigned on August 1, to go with the **Eureka Copper Products Corporation,** North East, Pa., as district representative of the eastern district. The New York office of the corporation is in the Grand Central Terminal. Mr. Carmody's duties as superintendent of electrical equipment included the direction of the electrical shops at Harmon and North White Plains. Mr. Carmody went to the New York Central in 1906 as general foreman of car equipment. He had previously worked on car equipment with the General Electric Company in different parts of the country, and while with the General Electric installed the New York Central's first electric locomotive. In 1909 he left the New York Central and for thirteen years was affiliated with commercial companies, including J. G. White & Company and the Safety Car Heating & Lighting Company. During the war he was production manager for the Long Island City plant of the Wright-Martin Aircraft Corporation. He returned to the New York Central in 1922 primarily for the purpose of appraising the traction lines of the New York & Harlem, but later was appointed superintendent of electrical equipment.

J. A. Carmody

Trade Publications

NORTHWEST CRAWLER EQUIPMENT.—The Northwest Engineering Company, Chicago, has issued a 40-page catalog describing and illustrating its crawler cranes, draglines and power shovels, which are made in sizes ranging from ½ to 1¼ cu. yd. capacity.

COFFIN FEEDWATER HEATER SYSTEM.—The J. S. Coffin, Jr., Company, 36 Grand avenue, Englewood, N. J., has issued a 12-page booklet descriptive of the operation of the Coffin feedwater heater system. The booklet is intended to instruct enginemen and enginehouse men how to operate successfully and inspect Coffin equipment. A diagrammatic drawing shows the flow of water through the system.

OPERATING REVENUES of the State Railways of Greece during 1927 amounted to the equivalent of $4,128,865 while total expenses were equivalent to $4,386,571, thus leaving a deficit of approximately $257,700. The Piraeus-Athens-Peloponnesus Railways of Greece during 1927 amounted to each reported profits for the year, the former having net earnings equivalent to $228,000 and the latter a gain of approximately $102,000. The State Railways operate approximately 50 per cent of the railway mileage of Greece or 1,425 kilometers of the 2,846-kilometer total. The Piraeus-Athens-Peloponnesus Railway operates 918 kilometers while the Thessaly Railways operate 241 kilometers.

Rolling stock in operation on the government lines during 1927 included 190 locomotives, 4,085 freight cars and 238 passenger cars. During the year 50 locomotives, nine freight cars and 30 passenger cars were purchased.

Construction

BALTIMORE & OHIO.—This company has reached an agreement with the city of Gary, Ind., for the construction of a highway viaduct over the tracks of the railroad at a point known as Miller in that city. Sixty-five per cent of the total cost of the viaduct will be borne by the railroad.

CANADIAN PACIFIC. — This company plans the construction of a double-deck bridge over the Saskatchewan River, north of Nipawin, Sask. The bridge will be 1,840 feet in length and the lower deck will be used for highway traffic.

CHICAGO, BURLINGTON & QUINCY.—A contract for the construction of a five-stall brick roundhouse at Peoria, Ill., has been awarded to W. M. Allen & Sons, Peoria, at a cost of about $25,000.

ERIE.—This company is now receiving bids for the erection of a station on the line of the New York, Susquehanna & Western at Pompton Lakes, N. J. This project was announced in the *Railway Age,* issue of August 4.

ERIE.—Bids are being received by this road for work in connection with the elimination of a grade crossing on Watt street, Youngstown, Ohio, and for the construction of two overhead bridges incident to another grade crossing elimination project on Andrews avenue, also in Youngstown.

ILLINOIS CENTRAL.—A contract for the construction of a grain elevator at Omaha, Neb., has been let to the L. A. Stinson Company, Chicago. The elevator proper will consist of 24 storage tanks which will have a combined capacity of 1,200,000 bu.

MISSOURI PACIFIC.—This company plans the construction with its own forces of stockyards and accompanying facilities at Haswell, Colo., at a cost of about $25,000. Included in the project will be the construction of 3,000 ft. of sidings, live stock pens covering an area of 45 acres, loading and branding chutes, feed racks and water storage tanks.

PENNSYLVANIA.—This road has awarded a contract to Deakman & Wells, Jersey City, N. J., for completion of work on the new concourse at its Journal Square station, Jersey City. Steel work on the new concourse has already been erected but the concrete, brick work, roof and interior and exterior fittings remain to be completed. Extensive alterations and renovations will also be carried out in the old station. The new concourse will be 60 by 240 feet.

PENNSYLVANIA.—Seven contracts, involving estimated total expenditures of approximately $700,000, have recently been awarded by this road for various construction projects at different points on its line. The list of projects and firms to which contracts have been awarded fol-

lows: Construction of a thawing plant to cost about $325,000 in connection with the new coal pier at South Philadelphia, Pa. (Newhall Company, Cleveland, Ohio); construction of an overhead bridge at a cost of approximately $110,000 to eliminate three grade crossings at Tullytown, Pa. (H. F. Curtis, Philadelphia, Pa.); grading, masonry, and track work, estimated to cost about $90,000 in connection with extension of Economy branch between Baden and Economy, Pa. (H. E. Culbertson Co., Cleveland, Ohio); construction of culverts, bridges and track work incident to elimination of grade crossings between Warwood and Short Creek, W. Va. —estimated cost of work $70,000 (Crosoau Construction Co., Brownsville, Pa.); construction of foundation for produce warehouse at Sixteenth Street, Pittsburgh, Pa. to cost about $55,000 (John F. Casey Co., Pittsburgh, Pa.); construction of a cornsheller plant to cost approximately $45,000 at the Girard Point Elevator, Philadelphia, Pa. (James Stewart Corp., Chicago); installation of protection screens for overhead bridges in connection with electrification from Philadelphia to West Chester, Pa., (Kauffman Construction Co., Philadelphia, Pa.)

ST. LOUIS-SAN FRANCISCO.—A contract has been awarded to the Gerhardt Construction Company, St. Louis, Mo., for the construction of a one-story brick and concrete passenger station at Pittsburg, Kan., at a cost of about $25,000. A contract for the construction of a one-story brick and stucco combined freight and passenger station at Rollo, Mo., has been let to Grant Wyatt, St. Louis, at a cost of about $40,000.

UNION PACIFIC.—A contract for the construction of a machine shop at Cedar City, Utah, has been let to Ryberg-Sorenson, Inc., Salt Lake City, Utah. A contract has been awarded to E. R. Green, Hastings, Neb., for the construction of a passenger station and accompanying facilities at Gering, Neb. The old station at that point will be moved to South Mitchell, Neb. A contract has been let to W. K. Martin, Kansas City, Mo., for the construction of a freight station at Kansas City, Kan.

ONE OF THE MOST PROFITABLE YEARS in their history is being enjoyed by the Swiss Federal Railways, according to reports received by the United States Department of Commerce. Earnings statistics, recently released, reveal that from January 1 to June 30, 1928, the gross operating receipts amounted to 193,926,682 Swiss francs, or approximately $37,352,000 as compared with 184,796,971 Swiss francs, or about $35,610,000, in the first six months of 1927.

Operating expenses, on the other hand, show only a slight increase and that is attributed principally to the system of insurance and pensions which went into effect at the first of the current year. For the first half of the present year, operating expenses amounted to 127,835,598 francs as compared with 126,786,662 francs in the corresponding half of 1927, thus leaving a net of 8,080,775 francs ($1,560,000) in excess of that for the same period of 1927.

Financial

CASTLEMAN RIVER.—*Reorganization.*—John Hersker, individually and as agent for the majority stockholders of the Castleman Valley and for a new company to be organized, the Castleman River, has applied to the Interstate Commerce Commission for authority for the acquisition of the line, from Worth Junction Pa., to a point near Jennings, Md., 14 miles, by the new company.

CHICAGO, ROCK ISLAND & PACIFIC.—*Bonds.*—This company and the Rock Island, Arkansas & Louisiana have petitioned the Interstate Commerce Commission for a reconsideration of its order of March 2, 1926, which authorized the Louisiana company to issue $1,600,000 of its first mortgage bonds and to deliver them to the Pacific company at par, in repayment for money advanced in respect of additions and betterments to the Louisiana company's line. The petition states that the Pacific company is unwilling to accept the bonds at par, because of conditions in the commission's order that it, as part consideration for delivery of the bonds, shall pay or cause to be paid to the Louisiana company an annual sum sufficient to amortize, over a period of 25 years, discount incurred by the Louisiana company in 1908 in the sale of certain of its bonds to the Pacific commission is asked to authorize the issue without the condition.

SOUTHERN.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon a branch line between Morristown, Tenn., and Corryton, 39.6 miles. Application to abandon this line had been twice refused, but is now granted in view of the large loss in operating the line and heavy repairs which would be necessary to keep it in operation, on account of recent flood damage. The Southern will provide motor truck freight service for the territory until December 31, 1928.

SOUTHERN PACIFIC.—*Asks Authority to Acquire N.W.P.*—This company has applied to the Interstate Commerce Commission for authority to acquire complete control of the Northwestern Pacific, which has a line from Sausalito to Trinidad, Calif., 477 miles, by purchasing the half interest in the stock held by the Atchison, Topeka & Santa Fe for $4,443,349. The Southern Pacific has owned the stock jointly with the Santa Fe. The application states that the price represents the cost of the stock to the Santa Fe and its advances to the Northwestern Pacific, without interest.

WACO, BEAUMONT, TRINITY & SABINE.—*Securities.*—This company has filed with Interstate Commerce Commission an application for authority to issue and sell $910,000 of common stock and $3,000,000 of first mortgage bonds, to retire the outstanding bond issue and all other obligations of the company to make provision for the construction of the first section of its proposed extensions. The commission in July, 1927, authorized the company to construct extensions from Livingston via Beaumont to Port Arthur, Tex., about 95 miles, and from Weldon to Waco, Tex., about 109 miles. The application shows that the company has set out upon the construction of these extensions, dividing the construction work and the financing into three sections, from Port Arthur via Port Neches and Beaumont to Elizabeth with a belt line around Beaumont, from Grayburg to Normangee, and from Normangee to Waco. The funds to be realized from the sale of the $3,000,000 of bonds will be appropriated to construct the first section with the belt line around Beaumont, and also to prosecute work on the section between Grayburg and Livingston. Provision is also made for the purchase of equipment for the first section. The company has arranged to sell the bonds to George M. Forman & Co., of Chicago, at 89 and interest, and it has let to the Foundation Company, of New York, a contract covering the entire construction between Port Arthur and Waco. The application also indicates that by or before completion of the section between Port Arthur and Elizabeth the company expects to bring out through George M. Forman & Co., a second series of bonds to cover cost of constructing the section between Grayburg and Normangee, and that while that section is under construction a third issue will be brought out to cover the cost of constructing the section between Normangee and Waco.

The plans of the company contemplate the construction of terminals on the Beaumont-Port Arthur waterway for operation in connection with the railroad, by a separate company.

Dividends Declared

Chicago, North Shore & Milwaukee.—Prior lien, $1.75, quarterly; preferred, $1.50, quarterly; both payable October 1 to holders of record September 15.

Erie & Pittsburgh.—$.87½, quarterly, payable September 10 to holders of record August 31.

Fonda, Johnston & Gloversville.—Preferred, 1½ per cent, quarterly, payable September 15 to holders of record September 10.

Average Prices of Stocks and of Bonds

	Sept. 4	Last week	Last year
Average price of 20 representative railway stocks.	124.84	121.78	120.88
Average price of 20 representative railway bonds..	93.62	92.93	94.95

* * *

On the D. L. & W.

Officers

Executive

Paul J. Neff, who has been promoted to assistant to the president of the Missouri Pacific, with headquarters at St. Louis, Mo., has been connected with that railroad and its subsidiaries since 1922. He was born at St. Louis on July 14, 1884, and graduated from the University of Kansas in 1906. He entered railway service in February, 1907, as a rodman on the St. Louis-San Francisco at Joplin, Mo., and later in the same year he was advanced to transitman and then to assistant engineer at Springfield, Mo. From April, 1910, to June, 1917, Mr. Neff served as assistant engineer and as engineer of construc-

Paul J. Neff

tion in the office of the chief engineer at Memphis, Tenn., at St. Louis and at Springfield, then being promoted to district engineer at Springfield. From September, 1918, to December, 1919, during federal control of the railroads, he acted as corporate chief engineer of the Frisco, with headquarters at St. Louis. For the next year Mr. Neff was general manager of the Wichita Falls, Ranger & Fort Worth and the Wichita Falls & Southern, with headquarters at Ranger, Tex., and in February, 1921, he was appointed chief engineer of the Texas lines of the Frisco, with headquarters at Fort Worth, Tex. In December, 1922, he was appointed assistant to the president of the International-Great Northern, with headquarters at Houston, Tex., and in February, 1925, he was appointed assistant executive vice-president of the I.-G. N. at Houston. Mr. Neff entered the service of the Missouri Pacific proper in June, 1926, as general superintendent of the Eastern district, with headquarters at St. Louis. His promotion to assistant to the president of the Missouri Pacific Lines became effective on September 1.

Financial, Legal and Accounting

F. E. Farrell, treasurer of the Jacksonville & Havana, with headquarters at Jacksonville, Ill., has in addition been appointed treasurer of the Chicago, Springfield & St. Louis, with headquarters at Springfield, Ill. **J. S. Ott** has been appointed assistant treasurer of the two railroads, with headquarters at Springfield.

Operating

D. A. Klumph has been appointed supervisor of safety and examiner of rules of the Pere Marquette, with headquarters at Grand Rapids, Mich.

H. L. Reed, general superintendent of the First district of the Chicago, Rock Island & Pacific, with headquarters at Des Moines, Ia., has been appointed acting general manager of the First district, with headquarters at the same point, temporarily succeeding **Daniel Coughlin,** who has been granted a leave of absence.

Harold E. Roll, who has been promoted to superintendent of the Little Rock division of the Missouri Pacific, with headquarters at McGehee, Ark., has been connected with that company since his first entry into railway service on January 1, 1909, as a train crew caller at the age of 14 years. Mr. Roll was born at Mattoon, Ill., on June 23, 1894, and attended the Little Rock (Ark.) high school. In April, 1909, he was advanced to yard clerk at Little Rock and late in the following year he was again advanced to chief night yard

Harold E. Roll

clerk at North Little Rock, Ark. From April, 1911, to September, 1923, Mr. Roll served in the train service as a brakeman and as a conductor, then being promoted to yardmaster at Pine Bluff, Ark. During March, 1925, he was general yardmaster at Ferriday, La., and Vidalia and Natchez, Miss., and he was then appointed acting trainmaster at McGehee. Late in 1925 he was promoted to trainmaster at Monroe, La., and in January, 1926, he was transferred to McGehee where he remained until July, when he was further promoted to assistant superintendent of the Louisiana division, with headquarters at El Dorado, Ark. Mr. Roll's promotion to superintendent of the Little Rock division became effective on September 1.

Traffic

D. E. McKee has been appointed assistant general freight agent of the Chicago, Burlington & Quincy, with headquarters at Chicago.

N. B. Wright, assistant freight traffic manager of the Central of Georgia, with headquarters at Savannah, Ga., has been appointed freight traffic manager, with the same headquarters.

H. E. Chenoweth, special representative of the Missouri Pacific Lines, with headquarters at Mexico City, Mex., has been promoted to foreign freight representative, with headquarters at St. Louis, Mo. This new position has been created to strengthen the foreign freight section of the Missouri Pacific traffic organization in line with the work that has recently been carried on to re-establish the tourist and freight traffic between Mexico and the United States.

Purchases and Stores

C. E. Kelsey, who has been appointed purchasing agent of the Denver & Salt Lake, with headquarters at Utah Junction, Colo., was born on January 10, 1890, at Denver, Colo. He attended high school in Denver and Everett, Wash., and entered railway service in November, 1909, in the stores department of the Denver & Rio Grande at Burnham, Colo. Four years later Mr. Kelsey was promoted to storekeeper, with headquarters at Grand Junction, Colo., where he remained until 1914, when he returned to Burnham as store foreman and stock clerk. In 1917 he was transferred to the office of the purchasing agent, remaining there until November, 1919, when he was appointed purchasing agent of the Arizona Lumber and Timber Company, with headquarters at Flagstaff, Ariz. Mr. Kelsey remained as purchasing agent of this company until his appointment as purchasing agent of the Denver & Salt Lake.

Henry W. Nelson, who has been promoted to purchasing agent of the New Orleans Great Northern, with headquarters at New Orleans, La., has been in the service of that railroad for nearly 15 years. He was born in New Orleans on December 12, 1890, and after attending high school in that city he entered railway service in January, 1911, with the New Orleans Terminal. In January, 1914, he entered the service of the New Orleans Great Northern in the stores department at Bogalusa, La.,

where he remained until April of the following year when he was transferred to the car accounting department. Mr. Nelson was transferred to the maintenance of way and signaling department in June, 1916, and during 1918 and the early part of 1919 he was in military service in the United States. He returned to the New Orleans Great Northern in the stores department in February, 1919, being transferred to the purchasing department at New Orleans in September, 1920. Mr. Nelson's promotion to purchasing agent became effective on August 1.

Lambert N. Hopkins, who has retired as purchasing agent of the Chicago, Burlington & Quincy, with headquarters at Chicago, has been in the service of that railroad continuously for 43 years, 23 years of which he spent as purchasing agent. He was born at Baltimore, Md., on April 26, 1852, and entered railway service as a clerk in the office of the ticket auditor of the Burlington in May, 1885. In the following year he was transferred to the trainmaster's office and in December, 1886, he was appointed assistant secre-

Lambert N. Hopkins

tary and assistant treasurer of the Peoria Union Elevator Company, which was owned by the Burlington. For a short period during 1887 he was a clerk in the paymaster's department of the Burlington and he was then advanced to assistant paymaster. Mr. Hopkins was further advanced to paymaster in 1888 where he remained until March, 1891, when he was promoted to auditor of passenger accounts. From 1896 to 1899 he served in the commissary and he was then appointed supply agent. Mr. Hopkins was promoted to purchasing agent on July 1, 1905.

Joseph R. Haynes, who has been promoted to purchasing agent of the Chicago, Burlington & Quincy, with headquarters at Chicago, has been connected with the purchasing department of that railroad for 41 years. He was born on December 29, 1868, at Chicago and entered railway service as an office boy in the purchasing department of the Burlington in 1887. After serving in a numer of minor positions in that department he was advanced to chief clerk in 1892. In 1905 Mr. Haynes was

Joseph R. Haynes

promoted to assistant purchasing agent. His promotion to purchasing agent became effective on September 1.

Mechanical

Walter A. Bender, mechanical inspector on the Missouri Pacific at St. Louis, Mo., has been promoted to master mechanic at Nevada, Mo., succeeding **V. H. Winnberg,** who has been assigned to other duties.

J. D. Muir, assistant works manager of the Angus shops of the Canadian Pacific, with headquarters at Montreal, Que., has been promoted to assistant superintendent of motive power and the car department with headquarters at Winnipeg, Man.

General

Following the taking over of the operation of the Saratoga & Encampment Valley by the Union Pacific **W. M. Jeffers,** general manager of the latter road has been appointed vice-president of the Saratoga & Encampment Valley. The following officers of the Union Pacific have been appointed to similar positions on the S. & E. V.: **N. H. Loomis,** general solicitor; **F. B. Choate,** general freight agent; **C. J. Collins,** general passenger agent; **H. A. Toland,** auditor; **M. M. Hinchley,** superintendent of car service; **A. R. McNitt,** freight claim agent; **W. C. Wolcott,** superintendent, and **N. A. Williams,** general superintendent. **H. V. Lacey** has been appointed general attorney and **C. T. Cullen,** assistant treasurer of the Union Pacific, has been appointed treasurer of the S. & E. V.

Obituary

James E. Goodman, master mechanic of the Northern Pacific at Duluth, Minn., from 1902 until his retirement on December 31, 1922, died at Los Angeles, Cal., on August 26, at the age of 78 years. At the time of his retirement Mr. Goodman had been in railway service for 54 years, 44 years of which had been with the Northern Pacific. While general division air brake inspector at St. Paul, Minn., in 1902 he served as president of the Air Brake Association.

Frank J. Jerome, assistant vice-president of the New York Central, died on September 4 at Painesville, O. Mr. Jerome was born on November 2, 1855, at Painesville, O., and attended law school at Ann Arbor, Mich., during 1876 and 1877. He entered railway service on June 1, 1893, and until 1902 served as attorney on the Lake Shore & Michigan Southern (now a part of the New York Central). From 1902 until 1912 Mr. Jerome was general attorney for the same road and from 1912 until 1918 served as general counsel of that road and of the New York Central. In 1918 he became assistant vice-president of the New York Central, which position he held until his death. From 1903 until 1912 he was also general attorney for the Lake Erie, Alliance & Wheeling (now a part of the New York Central). From 1914 until January, 1927, he was also a director of the New York Central.

"DANCING ENROUTE" was the feature of many of the Labor Day excursions operated by more than 34 railroads in western territory to more than 200 points, excluding several instances where reduced rates were in effect to all points on the lines. An example of this feature is contained in an advertisement of the Illinois Central calling attention to its $10 rate from Omaha, Neb., to Chicago. "Dancing Enroute—Five piece orchestra and separate amusement car—Lunch car serving sandwiches, coffee and soft drinks—Pillows available." The excursions this year varied from those of last year in that in some instances tickets were honored in sleeping cars and in coaches of regular trains as well as in special coach trains; that the return limit was as high as 15 days; and that several roads placed reduced rates in effect from certain cities to as many as 23 points along the line, the tickets being good on all trains.

The fares in effect were very low, the cost to the patron, based on the distance both ways, being, in general a trifle over one cent a mile. In many instances the cost was as low as 8½ mills a mile. The fares varied from 50 cents to $29.03. The distance which the patrons were carried (both ways) was as high as 1,420 miles. The distance in general, however, did not exceed 1,000 miles.

Among the cities of the west, Chicago exceeded in the number of excursions operated both in and out. Reduced rates were in effect from Chicago to over 100 points and to Chicago from 10 or more different points. A total of 12 roads had special rates from, and 11 to the city.